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A PRACTICAL TREATISE
ON
DISEASES OF THE HEART, LUNGS,
AND AIR-PASSAGES.

A PRACTICAL TREATISE
ON
DISEASES OF THE HEART,
LUNGS, AND AIR-PASSAGES,

With a Revision

OF
THE SEVERAL CLIMATES RECOMMENDED
IN THESE AFFECTIONS.

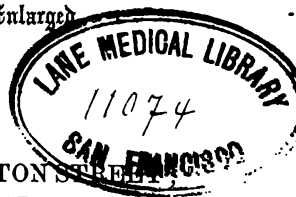
BY
JAMES BRIGHT, M.D., F.G.S.,
MEMBER OF THE ROYAL COLLEGE OF PHYSICIANS, LONDON.

Third Edition, Revised and Enlarged

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DEDICATION TO THE FIRST EDITION.

TO THE RIGHT HON.
THE EARL OF COTTENHAM,
&c., &c., &c.,

MY LORD,

I ESTEEM it a very high favour to be permitted to dedicate the following pages to your Lordship. Be pleased, therefore, to regard the act as a tribute of profound respect for your Lordship's exalted worth and talents, and in grateful remembrance of the uniform courtesy which I received while officiating as professional adviser to your Lordship and family at Copse Hill.

I have the honour to remain,

My Lord,

Your Lordship's most obedient

And faithful servant,

JAMES BRIGHT.

12, *Cambridge Square*, 1850.

It is with unfeigned regret the Author, as well as the country at large, has to lament the death of the noble and talented Lord Chancellor, to whom, by kind permission, the first edition of this work was dedicated.

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PREFACE
TO
THE THIRD EDITION.

HAVING devoted many years of careful study in investigating the diseases of the chest, and the best means for their alleviation and cure, as also from the flattering manner in which the two former editions of this work has been received, by my professional brethren and the public, I am induced to again trespass on their kindness, and in bringing out a third edition can only hope it may prove as acceptable as the former ones. To make this work complete as embracing "Diseases of the Chest," I have added Diseases of the Heart, with some

practical observations on Aneurism of the Aorta.

In order to enhance the utility of this Treatise in a practical point of view, a succinct account has been given of the anatomy of the chest, together with the organs of respiration and circulation, the physiology of respiration, and also the methods of exploring the physical conditions of the contained organs by sight, touch, and hearing. In this preliminary portion of the work, I have availed myself of the excellent treatises of Dr. Bock,* of Leipsic, and MM. Barth and Roger,† of Paris, as both are replete with valuable information.

For the same reason I have appended a chapter referable to climate—an element of singular efficacy in controlling the inroads of disease of the lungs and air-passages, if resorted to with due discrimination.

12, Cambridge Square, Hyde Park.

November, 1859.

* Handbuch der Anatomie des Menschen.

† Traité Pratique d'Auscultation. Paris, 1844.

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PRACTICAL OBSERVATIONS,

&c.

ERRATA.

Page 91, line 14—*for* extract canobis indicæ *read* extract canabis indica.

Page 228, line 1—*for* when is wine *read* when wine is.

Page 250, line 5—*for* tendinæ *read* tendinæ.

Page 252, line 5—*for* bruit *read* brunt.

Page 257, line 15—*for* tendinæ *read* tendinæ.

Page 259, line 4, *for* tendinæ *read* tendinæ.

The posterior wall of the chest, concave from above downwards, is formed by the bodies of the twelve dorsal vertebræ and the posterior ends of the ribs. The latter curve a little backwards and then outwards from

<i>Budleigh Salterton</i>	.	.	.	.	322
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PRACTICAL OBSERVATIONS,

&c.

PART I.

DESCRIPTIVE ANATOMY OF THE CHEST, &c.

~~~~~

#### ORGANS OF RESPIRATION AND CIRCULATION.

THE chest is separated from the head by the neck, and from the abdomen by the diaphragm. It is composed of thirty-seven bones, namely, twelve dorsal vertebræ, twenty-four ribs, and the breast-bone or sternum, and in appearance represents a truncated cone.

The posterior wall of the chest, concave from above downwards, is formed by the bodies of the twelve dorsal vertebræ and the posterior ends of the ribs. The latter curve a little backwards and then outwards from



the spine, so that the bodies of the vertebræ are inclined forwards into the thoracic cavity.

The side walls are in part bony, formed by the bodies of the ribs, which are situate in a concave direction towards the cavity. The interspaces are closed by the intercostal muscles.

The anterior wall is constituted by the cartilages of the ribs and sternum. It is much shorter than the posterior, because the seven true ribs only are attached to the sternum, while the remaining five are connected merely by the intervention of cartilage. Hence there exists below the sternum and between the anterior extremities of the false ribs, an angular space pertaining to the abdomen, to the border of which the diaphragm is affixed, and which forms a cross partition between the thoracic and abdominal cavity.

Thus, the cavity of the chest is completely closed in with exception of its superior and

most contracted portion, where an aperture is left betwixt the first dorsal vertebræ, the first pair of ribs, and the upper margin of the clavicular end of the sternum. Through this space pass the trachea, œsophagus, with important vessels and nerves. The cavity of the chest is more capacious in the middle, because in that situation the ribs are of the greatest length. Owing to the capability of movement in the ribs, a certain amount of mobility is imparted to the chest, whereby it is susceptible of exercising a kind of bellows-action of expansion and contraction upon its contents. The flexibility of the spine likewise admits of the chest being bent to a moderate degree forwards, backwards, and to the side.

The organs of respiration are the lungs, two in number, placed in the cavity of the thorax. They consist essentially of membranes, canals, and vesicles filled with air, which are surrounded with a dense network

derived from the pulmonary vessels; and also of a tubular apparatus for the ingress and egress of air, commencing with the trachea. Air is likewise conveyed through the pharynx and larynx, hence these may all be considered as accessory organs of respiration. In the same category must be included the pleuræ, or investing membranes of the lungs; and the thorax, for by its dilatation inspiration, and by its contraction expiration, are mainly effected.

The lungs are two soft spongy bodies composed of the ramifications of the pulmonary arteries and veins, of the bronchial arteries and veins, of the pulmonary nerves, of lymphatic vessels and glands, and of the ramifications of the bronchial tubes which end in numerous air-cells. They are of a conical figure, exactly fill each side of the thorax, and on both sides inclose the heart with its great vessels. The apex above is somewhat rounded off, and rises a little above

the level of the first rib. The base below is concave, and rests upon the diaphragm. The external surface, directed to the ribs, is convex; the internal surface, on the other hand, which borders on the pericardium, is flattened and slightly concave and attached near its centre by the root of the heart and great vessels.

Each lung consists of several portions, or lobes, separated from each other by deep fissures extending from the surface to near the root of the lungs, but partly again united by folds or duplicatures derived from the serous investment or pulmonic pleura, which stretch from one lobe to the other, and are termed interlobular ligaments. These lobes are composed of numerous small divisions called lobules, closely connected together by means of cellular texture. Each lung is specially inclosed in a serous sac, the pleura, which surrounds it in the same manner as the pericardium surrounds the heart, and



[illegible]

The left lung is narrower than the right, because, the heart lies more in that half of the chest; it is, however, longer, being ~~pressed~~ pushed upwards, by the spleen subjacent to, the diaphragm than is the right lung by the liver. It has only two lobes. The right lung, is broader but shorter than the left, and ~~consists~~ consists most commonly of three lobes.

The lungs in the adult are of a grey colour, sometimes verging on red, interspersed with spots of a dark blue or blackish tint. In young subjects these black spots are not so conspicuous, nor are the lungs so dark in hue, but more of a reddish cast. The lungs vary in respect to weight and volume, according to the configuration of the chest and the amount of air or blood they may happen

to contain. Upon an average the absolute weight of both lungs in the male, is on the authority of Bock, from three and a half to four pounds ; in the female, two pounds and three quarters. The specific gravity of lung, entirely stripped of air, exceeds that of water, for which reason it must sink in water. But neither the most forcible expiration, nor even the act of dying can ensure the expulsion of the whole of the air from the lungs. Hence the lungs after having once breathed, are specifically lighter than water, and float therein. On this is based the well-known hydrostatic test.

The trachea is a tolerably firm and elastic tube, composed of seventeen or twenty fibro-cartilages. It is convex anteriorly, but flat posteriorly, and is lined with mucous membrane, a continuation of that of the larynx. It is capable of extension, both in a longitudinal and a lateral direction. It is situate in the median line in the lower portion of the

front of the neck and the upper portion of the chest, and passes down before the œsophagus, from the sixth cervical to the third dorsal vertebra. In this course it is in the neck covered by the superficial layer of the cervical fascia, the sterno-hyoid and sterno-thyroid muscles, and the thyroid gland; in the chest it lies rather towards the right side, in the posterior mediastinum, behind the clavicular end of the sternum, the left jugular vein and the left carotid artery. Superiorly it is connected to the larynx; inferiorly it divides, behind the arch of the aorta, anteriorly to the body of the third dorsal vertebra, into the two bronchial tubes. These diverge at an almost obtuse angle, and pass obliquely downwards, the one to the right, the other to the left side of the lungs. They are then found to branch out in all directions, their ramifications becoming more and more minute, forming as it were the substance of the lungs, and eventually ter-

minating in the air-cells. A number of dark lymphatic glands, called bronchial glands, lie in the angle of division. The right bronchial tube is shorter but wider than the left, and divides at the fourth dorsal vertebra, ere it enters the right lung, into two, of which the lower and longer gives off a branch for the middle lobe of the lung; thus each lobe has a branch to itself. The left bronchial tube is longer and rather narrower than the right, dips deeper and more perpendicularly downwards, and divides into two branches at the level of the fifth dorsal vertebra.

The cartilaginous rings of the trachea, from seventeen to twenty in number, are very elastic and flexible. They are set horizontally one upon the top of the other at pretty equable distances, and surround the two anterior thirds of the tube; while the posterior wall attached to the œsophagus is flat and made up of membranes only. The



The trachea is a tube, the wall of which is composed of a cartilaginous ring, the fibres of which are arranged in a spiral manner. The trachea is situated in the neck, and is connected with the larynx above and the bronchi below. The trachea is a part of the respiratory system, and its function is to convey air from the larynx to the bronchi. The trachea is a tube, the wall of which is composed of a cartilaginous ring, the fibres of which are arranged in a spiral manner. The trachea is situated in the neck, and is connected with the larynx above and the bronchi below. The trachea is a part of the respiratory system, and its function is to convey air from the larynx to the bronchi.

which are inserted into the extremities of the cartilaginous rings, and by approximating these, contract the windpipe; of yellow elastic longitudinal fibres; and lastly, of mucous membrane. Reisseissen traced the muscular and elastic fibres into the bronchial ramifications, devoid of any cartilage; and Rudolphi discovered elastic fibres, after all vestige of muscular texture had disappeared.

The mucous membrane lines the entire tract of the air-passages, from the larynx to the air-cells; and may be regarded as the fundamental structure, since it alone forms the air-cells. Posteriorly it offers a few longitudinal folds. A vast number of muciparous glands open along its inner surface. These are most numerous at the upper portion, on the posterior wall, and about the division of the bronchial tubes. The mucous lining of the trachea, although not so sensitive as that of the larynx, is still so in a very eminent degree. Hence, whenever it

is irritated by foreign substances, cough ensues for the purpose of their expulsion. The windpipe is duly supplied with arteries, veins, nerves, lymphatic vessels, and glands.

The air-cells are roundish angular vesicles closely aggregated together, but not communicating one with another. They are united, however, by a common vascular twig. Such a congeries of cells with its tiny vessel constitutes a minute roundish lobule, half a line in diameter, which is surrounded by a layer of cellular texture, of from  $\frac{1}{10}$  to  $\frac{1}{8}$  of a line in thickness. This cellular layer conjoins several of these congeries so as to form a lung lobule, and which is supplied by a larger and aborescent vascular twig. Thus the bronchial ramifications may be likened to the efferent ducts of a conglomerate gland and the air-cells to the acini. The latter indeed are merely the blind vesicular terminations of the finest bronchial tubes, essentially composed of delicate,

transparent mucous membrane, and from  $\frac{1}{18}$  to  $\frac{1}{6}$  of a line in diameter.

The parenchymatous cellular texture, which serves as the connecting medium for the principal pulmonary textures, consists of short delicate filaments. It occurs most abundantly where the bronchial tubes divide and the great blood-vessels pass along with them into the lungs. It contains no fat, but a deposit of blackish pigment, in the shape of roundish granules of about  $\frac{1}{26}$  of a line in diameter, which glimmers through the pleura, as black specks upon the surface of the lung.

The pleura is the external investment of the lungs, to which it is intimately attached by means of a cellular texture. It is of a serous character. It dips into the fissures, and betwixt the chief lobes forms the interlobular ligaments.

The pleuræ may be described as two dis-





right receives the venous blood from the system and propels it to the lungs; the left, on the other hand, receives the arterial blood from the lungs, and through the aorta distributes it over the whole body. Each of these halves is divided by a partition into two cavities, namely, an auricle and a ventricle, which are connected by an opening, but not in direct communication with the cavities of the other half. The heart, which thus comprises four cavities, is invested externally by a serous membrane, a continuation of the pericardium, internally by the general arterial lining membrane.

The heart lies obliquely in the fore-part of the chest, between the two lungs, not exactly in the mesial line, but rather to the left. Thus its broad portion is directed to the right, upwards and backwards, the apex to the left, downwards and forwards. The base is situate behind the right border of the breast-bone, and mounts up from the

sternal insertion of the diaphragm to nearly the point where the cartilage of the fourth and fifth rib conjoins the sternum ; the hindermost portion is not far from the spine, in the vicinity of the eighth dorsal vertebra. The apex is directed towards the cartilage of the sixth rib, or the space between the fifth and sixth ; the middle portion is behind the breast bone : the upper convex surface is in the sternal direction ; the inferior flat surface rests upon the diaphragm. The right half of the heart is turned rather forwards towards the anterior wall of the chest, the left lies chiefly with its auricle buried between the lungs. The heart, in the living subject, is constantly shifting its position with the varying movements and attitudes of the body, but only to a slight extent. It sinks downwards a little with the diaphragm, for example, on inspiration, and reascends on expiration.

The four cavities contained in the heart

are in all probability, during life, of one uniform size; otherwise an unequal amount of blood would be transmitted through them, and necessarily disturb the regularity of the circulation. In the dead body the right half of the heart seems more roomy than the left.

The auricles form the upper division of the two sides of the heart, and are distinguished by their thin lax walls, their somewhat rounded quadrangular shape, and by a blind appendage called the auricular process. As their only function is to urge the blood into the subjacent ventricle, they are but scantily provided with muscularfibres. Veins alone discharge their contents into the auricles; namely, the *venæ cavæ* and other small veins into the right auricle, and the pulmonary veins into the left. The auricles are separated by a thin membranous partition, which, during foetal existence, is rendered pervious by an oval aperture. They possess



two sets of openings, namely, the venous orifices, by which the blood enters, and the ventricular aperture, by which it may flow from the auricle into the ventricle.

The ventricles are cavities situate towards the apex of each half of the heart, conical in form, and directed downwards. Their walls consist of several muscular layers. They are united externally by a thin layer of fleshy fibres, but internally separated by a muscular partition of some strength. The innermost muscular layer, of which the fibres proceed from the base to the apex, form roundish prominent bundles, interlacing one with the other, termed fleshy columns. These are most developed in the proximity of the auricular opening, where they are loose and surmounted by papillary projections, connected with the valve of the above opening by means of thin filaments, usually designated tendinous cords. At the superior portion of each ventricle are two openings,

of which the external communicates with the auricle, the internal with the corresponding artery. Both openings are furnished with valves, the use of which is to prevent the blood returning to the parts whence it came. Each ventricle may be viewed as resolvable into two halves, of which the one is prolonged into the auricular orifice, the other into the arterial, but which differ in some respects. Thus, in the right ventricle they meet at an angle, in the left they run parallel of each other, and are parted by two strong and projecting fleshy columns, from which numerous tendinous threads are affixed to the auricular or, so-called, mitral valve. The two ventricles offer, besides, other characteristic features. The right, which lies more in front, is conical, and does not reach quite as far as the apex; its walls are but one-third the thickness of the left ventricle, its functions being to propel the blood only into the lungs. It possesses thin-

ner valves and smaller papillary muscles. Its relative position to that of the left is such, that its axis, if prolonged, would cross with that of the left at an acute angle. The latter ventricle, on the contrary, takes in the whole apex of the heart, is of an oval form, and has a treble thickness of walls to enable it to urge on the column of blood to the several arteries of the body. The valves at the margin of the right auricular opening are formed by a fold of the lining membrane which divides into three portions. They are the tricuspid valves. In the pulmonary artery and aorta we have the semilunar valves, composed in like manner of three folds, extending into the vessel. Those at the circumference of the left auricular ventricular opening are called the mitral valves, because the descending fold of the membrane divides into two portions; these are stronger, but otherwise similar to the tricuspid valves in the right ventricles, and answer a similar

office, namely, that of preventing the blood returning from the left auricle.

In regard to the weight of the heart considerable discrepancy of opinion prevails among anatomists. Bouillaud, who has devoted much attention to this point, gives the following as the result of numerous trials:—The mean weight is 8 ounces 3 drachms, the greatest 11 ounces, the least 6 ounces 2 drachms.

According to the same observer, the mean thickness of the walls may be reckoned for the left ventricle in an adult subject at 7 lines, for the right at  $2\frac{1}{2}$ . Age, growth, strength, and sex exercise a great influence relative to the thickness, which appears to increase between the ages of sixteen and forty. The wall of the left auricle is about one-third thicker than that of the right. The right auricular-ventricular opening is wider than the left. Both of these openings have a greater circumference

than the arterial ones, which latter are nearly alike. The absolute weight of the heart is not dependent so much on the volume of the whole organ as on the thickness of individual portions. The heart is supplied with arteries, termed the coronary arteries; with veins, lymphatics, and nerves. Dr. Robert Lee has been at great pains to demonstrate that every artery distributed through the walls of the heart is supplied with nerves, upon which ganglia are formed. (Phil. Trans., 1849.)

The pericardium is a membranous fibro-serous shut sac, in which the heart is inserted, like the head in a nightcap. The heart, however, can move freely, and neither press upon nor be pressed upon by the adjunct parts. For the internal layer of this sac being attached by cellular tendons laterally to the pleura, and beneath to the tendinous structure of the diaphragm, is kept tense, whereby a free space is preserved be-

tween it and the heart. The diaphragmatic insertion in adults is further strengthened by tendinous fibres, which pass from the diaphragm to the heart. Superiorly this external layer of the pericardium extends upwards beyond the origin of the great vessels, and behind the clavicular end of the sternum and second rib, forming a kind of sheath for the superior vena cava and the aorta, but without penetrating between them, and then descends to the heart. This portion, which serves to invest both the great vessels and the heart, is the internal layer of the pericardium, and is separated from the external by the closed space above mentioned. The internal surfaces are very smooth, moistened with serous vapour, to counteract friction and adhesion between the two surfaces. This vaporous exhalation is condensed after death into serous fluid varying in quantity from a drachm to half an ounce.

The outer layer of the pericardium consists of an external fibrous and an internal serous lamina, both of which are so intimately connected as to defy all attempts at separation. It is only where the pericardium invests the great vascular trunks that these two laminæ are apart, and leave behind them a triangular space, usually filled with fat; the external fibrous lamina, in which dense fibres can be perceived coursing in various directions, mounts along the vessels and forms delicate sheaths around them, while the inner serous lamina, descends along these to the heart.

Besides the serous membrane which lines the pericardium, and is reflected over the whole surface of the heart; this membrane is connected rather firmly by cellular texture with another tunic, for the description of which the profession is indebted to Dr. Robert Lee. "This second membrane has a dense fibrous structure, is semi-transparent,

and resembles in a striking manner the apo-neurotic expansions of fascia, covering muscles in other parts of the body, and, like them, sends numerous fibres or processes between the muscular fasciculi, blood-vessels, nerves, and adipose substances of the heart, which it binds closely together. This apo-neurotic expansion, investing both ventricles and auricles, may be appropriately termed, from its structure and function, the fibrous membrane, or *Cardiac Fascia*." (Phil. Trans., 1849.)

The pericardium is supplied with arteries, veins, and lymphatics, but no nerves have been hitherto discovered in its structure.

---

### *The Sounds of the Heart.*

On applying the ear to the chest the action of the heart is found to be attended with two sounds, the first dull and pro-



longed, and the second short and clear. In their natural order the second of these sounds follows upon the first without any perceptible interval, and then follows a period of rest of about the same duration as the time occupied in the two sounds. Now these auscultatory phenomena are a matter of great interest, for upon their alteration the diagnosis of cardiac disease is mainly founded, and therefore it is necessary to pay some attention to the manner of their causation.

The *first sound* then is found to be connected with the systole, or contraction of the ventricles, and therefore it may be due to the muscular action of the ventricles, as was supposed by Dr. Hope, it may be due to the expansion and tension of the mitral valves, as is held by Dr. Billing and Dr. Skoda, it may be due to the forcible propulsion of blood into the arterial trunks, or to the flapping back of the sigmoid and semilunar

valves, or to the impulse of the apex of the heart against the side of the chest. All these causes do in all probability contribute something to the phenomenon, and it is not easy to say which is the one most concerned. Indirectly or directly, however, the muscular contraction of the ventricle is all important in its production, and this is the fact of most vital moment in connexion with the matter. This is to be gathered from the investigations of Dr. Stokes upon the change which the first sound of the heart undergoes in the softened heart of typhus fever, investigations in which it was found that the first sound and the cardiac impulse vanish *pari passu* either in great measure, or altogether in proportion as the heart loses its proper tone, and return *pari passu* as the tone is recovered. This fact does not show that the first sound is caused by the contraction of the muscle; a conclusion which is altogether untenable, seeing that

this sound is either lost or obscured in cases of hypertrophy, where the cardiac muscle is more developed and more vigorous than natural—but it does show that the failure of the sound is consequent upon the failure of the muscular energy of the ventricles. The immediate cause of the failure of the sound may be that the auriculo-ventricular valves are not driven back with sufficient force, and this would indeed seem to be the principal reason. It may also be that the blood for the same reason is not injected with sufficient force into the arteries; and that this has something to do in the matter, is to be argued from the fact that a sound very similar to the first sound of the heart, and not undistinguishable from it, is produced by the injection of blood into the sac of an aneurism. It may be that the heart is not tilted with sufficient force against the side. One or all these causes may operate immediately in accounting for the failure of the

sound; but be this as it may (and this is the important practical fact), the remote cause is, that the muscular energy of the ventricle has failed.

The *second sound*, on the other hand, is coterminous with the diastole or relaxation of the ventricle. It may therefore be due to one or more of the following causes,—to contraction of the auricles, to dilatation of the ventricles, to the rushing of blood into the ventricles, or to the flapping back of the sigmoid and semilunar valves. Of these several causes, the one last mentioned seems to be the most important, and this, among other reasons, the fact already mentioned, the condition of the heart in typhus fever; in this disease it is found that, though the first sound failed in all instances, and often disappeared altogether, that the second sound generally remained, the heart beating with only one sound: this circumstance, in the opinion of Dr. Stokes, removes this

sound from the same cause as the first, namely, the muscular irritability of the heart, and relates it to some other cause, which cause he argues, with the majority of physiologists, in thinking must be the elastic or irritable contraction of the aorta, exercised upon the contained column of blood, so as to drive it back upon the valves at the outlet of the heart, and to cause the sound by opening out and stretching these valves. And that this is the true explanation, is also rendered probable by the fact that disease of these valves, which unfits them for performing their allotted function, destroys the second sound, as also does that mechanical interference in which the valves have been held back by a needle introduced through the coats of the vessel, as has been done in many experiments on the lower animals.

Some maintain that a second sound as well as the first may be produced away from



the heart, but there appears a want of evidence to show that a second sound, when it is heard in the arteries, is not really the second sound transmitted from the heart. It is an argument that this is the case, that the double second sound, which is usually heard in thoracic aneurisms, is not heard in aneurisms seated in the abdomen or limbs. It is also an argument to the same effect, that peculiar whizzing, sawing, or other unnatural sounds generated in the heart, are not unfrequently transmitted, not only into the large, but into the smaller arterial trunks. Skoda has complicated this difficult question by stating that, by auscultating the heart alone, he can satisfy himself that the sounds of the heart are sometimes produced exclusively in the right ventricle, sometimes in the left, sometimes in the aorta; or, at any rate, he can satisfy himself that at times these sounds are not produced in one or other of those sites; but to

determine the correctness of this opinion implies a skill in the art of auscultating which few can hope to attain to. This difficulty may, however, be set aside for the present.

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*The Physiology of Respiration.*

Respiration is an organic chemical process intimately connected with life, by means of which the atmospheric air, charged with the requisite amount of oxygen for animals to breathe, passes through the nostrils, mouth, larynx, and trachea, into the ultimate bronchial ramifications and air-cells. This constitutes inspiration. The air is thus brought into contact with the dark venous blood which circulates in the minute capillary network derived from the terminal branches of the pulmonary artery, and distributed upon the walls of the pulmonary cells. A portion of the oxygen of

the air penetrates the delicate walls of the capillaries (while the nitrogen serves to keep the pulmonary cells dilated), and combines with the carbon and hydrogen of the venous blood. With these elements it forms carbonic acid and water: the latter indeed may be merely exhaled from the blood. These fresh products, mingled with the nitrogen remaining in the cells, are withdrawn in the act of expiration. Another portion of the oxygen of the air inspired, combines with the constituents of the blood and of the chyle mingled with it, shortly before its ingress to the right auricle of the heart. By the agency of the air, the dark, carbonized, venous blood is transformed into florid, oxygenized, arterial blood. Under these circumstances the temperature is modified, inasmuch as the free caloric of the venous blood is partly carried off with the watery vapour, while the caloric in the arte-



rial blood becomes more fixed, the capacity being changed.

Respiration consists in alternate inspiration and expiration. At each act, according to Herbst, from 20 to 25 cubic inches, and to Davy from 10 to 13 cubic inches, are taken in, and the like quantity again emitted. Inspiration is effected by dilatation of the cavity of the chest; expiration by its contraction, and also by the contraction of the elastic and muscular fibres of the bronchial tubes. When the walls of the chest are expanded, a void space, into which the air seeks to gain entrance, is left between the costal and the pulmonary pleura, in consequence of the withdrawal of the former from the latter. It enters accordingly, by the windpipe and bronchial tubes, into the air-cells, and expands the lungs so that their surface progressively follows the expanding walls of the chest. This, however, is only

possible so long as the cavity of the chest is closed on all sides, and so long as no pressure of the air from without can affect the equilibrium of the pressure of the air from the windpipe. During expiration the whole of the air is not expelled from the lungs; there are left, after ordinary expiration, 108, and after forced expiration, 35 cubic inches. Further, between every inspiration and expiration there is a pause, a period of repose, the duration of which is equivalent to the time occupied in inspiration and expiration conjointly. Each of these two acts, during ordinary, tranquil, and involuntary breathing, corresponds nearly with the period of a beat of the pulse. Hence from eighteen to twenty respirations will coincide with from seventy to seventy-five arterial pulsations in the minute. If controlled by the will, the breathing may be rendered slower or faster, deeper or shorter, than natural. It is also influenced by temperament and by frame

of mind. As a general rule, however, all the respiratory movements proceed involuntarily, without our knowledge, during sleep, and at other times with a steady rhythm, and obey the will only so far as certain *respiratory* muscles are concerned.

Atmospheric air, composed by volume of 21 parts of oxygen and 79 of nitrogen, is the only gaseous mixture which can be breathed for a continuance without detriment to life. After having permeated the lungs, it is unfit for respiration. It then contains a notable amount of carbonic acid and watery vapour, with a diminished proportion of oxygen. According to Allen and Pepys, expired air consists of 8 per cent. of carbonic acid gas, 13 per cent. of oxygen, and 79 of nitrogen.

The absorption of oxygen through the delicate humid walls of the air-cells into the current blood, and the exhalation of carbonic acid, go on uninterruptedly both during expiration and inspiration. Because, if it be

considered, that during expiration the lungs are never void but contain partly atmospheric air and partly carbonic acid, it is obvious that while in expiration the contaminated air is for the most part discharged, in inspiration the air remaining in the lungs receives a fresh accession of respirable atmospheric air.

A variety of theories have been propounded for explaining the chemical process of respiration, and which the reader will find detailed in the treatises on Chemistry.

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*Methods of exploring the Physical Conditions of the Chest by Sight, Touch, and Hearing.*

The examination of the chest affords the medical practitioner very important information touching various diseases of the internal organs. Hence, the various modifications of form, of direction of volume, of consistence, and of temperature, deserve a careful study.

The inspection of the chest ought to be



made either with the patient placed horizontally upon his back, or else seated or standing quite erect.

Notice ought to be taken as to whether any undue prominence or depression exists above or below the clavicles, or in the sternal region ; whether respiration is effected by the ribs and diaphragm, by the ribs alone, or by the diaphragm alone ; and further, by placing the flat hands on each side of the chest, whether both lungs have free play, and expand the chest equally.

Measurement is an extremely valuable means of exploration. M. Chomel, who has devoted much attention to this subject, employs for the purpose a measuring tape, and also callipers, which accurately indicate the different antero-posterior diameters of the chest.

In using the measuring tape the patient ought to be seated, with his arms crossed over the head. The practitioner then ascer-

tains the middle part of the dorsal region by the spinous processes of the vertebræ, the middle of the sternal region by help of a thread which is allowed to fall from the superior notch of the sternum to the middle of the ensiform cartilage. He then applies the tape successively on the two sides, and determines the difference of length. It is advisable to apply the tape firmly upon the chest of fat persons, in order to find out with exactness the real volume of the thoracic cavity, and also to repeat the measurement several times. This mode of examination, like every other, requires considerable practice to obviate the chance of error. (*Elémens de Path. gen.* p. 436.)

The condition of the intercostal spaces ought to be carefully noted. Thus, if they appear enlarged, and almost effaced on one side, pleuritic effusion may be predicated.

A narrowing of one side of the chest, together with a fixed inclination of the ribs

downwards, irregularity of form, depression of the shoulder of the same side, and of the nipple, corresponding with some degree of lateral curvature of the spine. towards the opposite side, betoken the existence of false membranes resulting from bygone pleurisy.

Dilatation of the chest, accompanied with enlargement and obliteration of the intercostal spaces, is pathognomonic of emphysema when that affection is fully developed. It is at the anterior and superior part that we usually find the prominence caused by pulmonary emphysema, towards the spaces situate below and sometimes above the clavicle. The prominences most commonly observed in front are those under the clavicles, and which extend to the nipple or beyond, and those occurring in the præcordial region. They are sometimes seen, however, as above stated, behind the clavicles, and likewise in the dorsal region.

A general dilatation of the chest, however, is never met with except in very marked instances of emphysema of the lungs.

A gradual augmentation of one side of the chest, not circumscribed but general, and attended by enlargement and obliteration of the intercostal spaces, is met with in pneumo-thorax.

Straitness of the chest has been from time immemorial recognized as indicating the presence of tubercles in the lungs. For some interesting details on this subject the profession is indebted to Dr. Hirtz, author of a memoir entitled, "*Recherches cliniques sur quelques points de diagnostic de la phthisie pulmonaire.*" Strasbourg, 1836. He has there shown that in a hundred adults, who never had any disease capable of producing deformity of the chest, the mean of the difference between the superior part of the chest and that of the inferior is about 7 centimetres (a centimetre is  $\frac{1}{4}$ ths of an



inch) in favour of the former, the extremes ranging between 13 and 3 centims. In one hundred adult females the difference is only 5 centims. In fifty children the difference is but 2 centims. The more robust the individual, the more the advantage is in favour of the superior.

Now, M. Hirtz has demonstrated that this difference diminished, disappeared, and ranged in the inverse proportion in the instance of phthisical subjects, according to the stage of the malady. In one hundred phthisical patients arrived at the last period, there was a mean difference of 4 centims. in favour of the inferior circumference; in the early stages merely 2 centims. Whence it follows that the chest has undergone upon an average a change of 11 centims. between the state of health and that of phthisis at its third period. This difference is not the result of wasting, for it is never witnessed in marasmus resulting from

other disease; it is therefore peculiar to phthisis.

This disposition is never met with in persons exempt from tubercles, and even in the latter the chest has always been well formed before the production of this affection of the lungs. It is therefore manifest that this conformation is the sequel of tubercles. The conclusions of the author are—1st, that the chest in its natural condition, surrounded with the soft parts, presents the shape of an inverted cone; 2nd, that in phthisical subjects the chest suffers at its summit a notable straitening, in consequence of which the thoracic cone assumes an inverse position; 3rd, that this deformity is visible in general from the commencement of the disease; 4th, that it increases directly with the progress of the disease; 5th, that in the female it is less marked and more tardy than in the male; 6th,

that this disposition is peculiar to consumptive persons, and may be reckoned a sure sign of tubercles.

As a general rule the capacity of the chest in the above subjects is less than that of healthy individuals, upon an average of from 4 to 5 centims.

The most approved mode of exploring the chest by touch is that of percussion. To percuss skilfully, the physician ought to place himself in a position so that he can without constraint strike at a right angle, and at a moderate distance, with uniform force, the different regions of the chest he may deem it expedient to explore. He may perform this *directly* with his four fingers placed together and slightly bent, or with the flat of the hand, in order to determine the general sonorousness of the chest. But to obtain more accurate knowledge, it is advisable to interpose between the fingers

and the part struck some solid substance, such as a disc of ivory or caoutchouc, or one or more fingers of the other hand. By this procedure much more clear and distinct sounds are elicited, less force is requisite, and the impulse abated; so that mediate percussion is decidedly preferable to immediate or direct. It can, moreover, be prolonged without inconvenience, and resorted to without risk on delicate or sensitive parts, and in cases where the direct method is totally inadmissible. It further enables the practitioner to recognize lesions of slight extent, to localize the diseased organs, so to speak, and trace their boundaries, as also the progressive morbid phases.

For percussion, many mechanical contrivances have been suggested and some of them very ingenious, but there is no better medium than the finger; consisting of hard and soft textures, it resembles in structure the thoracic walls, and scarcely interferes with the sounds

~~position. It consists of the pressure~~  
~~applied to the surface of the~~  
~~and is of course always a local~~

The index or middle finger is generally used, placed in a state of pronation. Sometimes, however, it is more convenient to reverse the position of the finger and to strike against the palmar surface. As a general rule, the left hand is laid upon the spine to be examined and the middle finger, separated from the rest, is allowed to remain fully extended in close apposition with the subjacent parts. It is then to be struck with the extremity of one or more fingers of the other hand, with a movement directed from the wrist, and not from the elbow or shoulder. If a slight stroke is adequate to the effect, one finger may be used, otherwise two or even three, bent at right angles with the palm. It is, however, advantageous to practice percussion in a gentle manner. We think not only give the patient less annoy-

ance, but elicit a purer character of sound. It is, at all events, best to commence gently, and then proceed to tap with more force, should it be found necessary. M. Mailliot observes, "By slight percussion we are enabled to judge of the superficial layers of the lung, and by successively augmenting the force to ascertain the density of the lungs at different degrees of depth."

In percussing, the hand is to be alternately raised and lowered, giving a series of strokes perpendicular to the surface, and in quick succession. Sometimes a single abrupt tap is given, after which the finger is immediately raised; at other times it is allowed to remain a few seconds in contact, for the purpose of arresting the vibration of sound, and, consequently, of better estimating the amount of resistance and of induration in the organs beneath.

The investigation may be commenced by percussing over the very spot corresponding



to the diseased organ. It is, however, better practice to begin a little way off, and advance gradually to the site of the affection, because the ear is thereby better enabled to appreciate minuter shades of difference, and discriminate more accurately existing changes.

The part to be examined ought to be bare, or covered with any light tissue excepting silk or flannel, which, from the rustling they occasion, are apt to cause a confusion of sound.

The patient may either stand or sit with the arms hanging by the side, the head erect, and the shoulders depressed a little. But in order to explore the anterior part of the chest, the most eligible position is with the patient laid more or less horizontally upon the back, provided the dyspnœa offers no hindrance. In examining the region above the clavicle, the head must be turned aside; the sides of the chest, the arm must be elevated; and the back of the chest, the patient



is to be seated, with the head lowered, and the arms crossed in front. Where the presence of fluid effusion is suspected, the patient may be placed on all-fours, so as to allow the fluid to be displaced. It is always expedient to percuss alternately on each side of the chest in points corresponding, with equable force, during one continued posture, and both during inspiration and expiration.

The chest, when adroitly percussed, agreeably to the precepts above given, emits a clear resonance, varying according to the degree of thickness of its walls. Thus, the resonance is less distinct at the level of the nipple in fat persons. It is likewise obscure on the left side in the præcordial region, but clear elsewhere as far as the seventh rib, below which point it is replaced by the tympanic resonance yielded by the splenic extremity of the stomach. On the right side it is clear from above downwards to the level

of the sixth or seventh rib, where it is deadened by the liver.

The sternal region furnishes, superiorly, a clear sound, less clear, however, than the subclavicular, and which becomes dull about the level of the third rib.

Laterally the sound is very clear in the axillary space as far as the fifth, sixth, or seventh rib.

Posteriorly, in the interscapular region, the resonance is moderate, and ceases about the level of the second or third false rib; more outwards it is very obscure in the space situated above the ridge of the scapula, but rather less so in the space below the ridge of that bone. This is owing to thickness of the thoracic wall.

Inferiorly, in the region corresponding to the angles of the ribs, there is perfect resonance. A little lower down it is inaudible, owing to the encroachment of the posterior

border of the liver on the right side and the spleen on the left.

There are other circumstances besides the above which modify the intensity of resonance. Thus, it is more marked in elderly persons, in whom the chest is emaciated; in very young people, in whom the muscular layers are very thin; and, generally speaking, in proportion to the amplitude of the thorax and tenuity of its walls. The intensity is diminished when the chest is narrow and the walls thickened from the development of muscle and fat; as also in rickets from the slow mechanical compression of the substance of the lung and the thickening of the surrounding osseous structure.

The following are the alterations produced by disease:—The resonance may be preternaturally increased. This occurs in hernia of the lung or subcutaneous emphysema, but much more frequently in different forms of pulmonary emphysema; occasionally in cer-

tain cases of pleuritic effusion above the level of the liquid ; and sometimes, though rarely, in the instance of a cavity of the lungs, or that of dilatation of the bronchial tubes.

Farther, the resonance may be greatly exaggerated and become tympanitic, simulating the sound emitted upon striking the left hypochondrium when the stomach is distended with flatus. This condition is generally limited to a narrow space, and is indicative of gaseous effusion into the pleura, pneumothorax.

On the other hand, the sonorousness of the chest may be impaired, it may be obscure, or it may be dull. It is said to be obscure when there is still a certain resonance. Although this obscuration may exist independently of disease, it is frequently encountered in morbid states of the thoracic walls, of the pleura, and of the lungs ; as, for example, in serous infiltration, and in abscess of the tho-

racic walls ; in pleurodynia, more commonly in pleurisy, both at an early and an advanced stage ; in slight hydrothorax ; in incipient pneumonia ; in phthisis ; and in the instance of adventitious growths.

The sound is said to be dull, when it resembles that which is elicited upon striking the inside of the thigh. It is usually attended with more or less resistance to the finger. It depends either upon a considerable induration of the lung, such as is produced by numerous tubercles ; upon pneumonia advanced to the stage of hepatization ; on compression with displacement of the lung, the result of a copious effusion of serosity, blood, or pus ; or, which is rare, upon tumours.

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### *Of Auscultation.*

On putting the ear to the chest of a well-formed healthy individual, a slight murmur is perceived analogous to that of a person in



a quiet sleep, or heaving a deep sigh. It is termed the natural respiratory or vesicular murmur; and is composed of two distinct murmurs, namely, that of inspiration, which is the more intense and prolonged, and that of expiration.

The vesicular murmur is loudest in those points where the lung is most voluminous. Uniform on both sides, it is sometimes more intense towards the top of the right lung, and usually harsh in character towards the root of the bronchial tubes. It is most audible when the respiration is full and rapid; and particularly marked in children, whence the term *puerile* has been introduced.

Auscultation is the study of the various modifications of sound referable to certain morbid conditions of the organs contained within the chest, and is either immediate or mediate. In the former case the ear alone is employed; in the latter, a wooden cylinder surmounted by a flat disc made of the same

material, and perforated in the centre, called a stethoscope. The stethoscope has the advantage of being applicable in many situations where the ear cannot be brought to bear, as also of circumscribing the sound and defining its limits with greater precision. As a general rule, however, where accurate diagnosis is sought, both modes of procedure ought to be practised. Thus, at the upper and front part of the chest, in the regions above and below the clavicles, the stethoscope is preferable, more especially for lean subjects. Lower down it is better to employ the ear alone, except in the instance of full-bosomed females; as also, posteriorly from the base of the thorax to the spine of the scapula, because it is difficult to retain the extremity of the cylinder in close contact with a convex surface. For the depression above the spine of the scapula, again, the stethoscope is eligible; but for the sides of



the chest, with exception of the hollow of the axilla, the ear is more convenient.

An elastic flexible stethoscope, about twenty inches in length, is admirably adapted for examining patients confined to their beds, since you save them the pain and trouble of sitting up or altering their position.

The patient ought to be directed to breathe fairly, so as neither to make any noise with the mouth, nor to hold in his breath. Both sides of the chest ought to be examined comparatively in points corresponding, and throughout their whole extent. A partial auscultation is very apt to lead to an erroneous judgment.

The respiratory murmur may be altered as regards intensity, rhythm, and character, and by preternatural sounds.

With reference to intensity, it may be either strong, feeble, or null.

Loud or puerile respiration does not indi-

cate so much the presence of disease in the spot where it is heard, as disease in some part more or less remote. It is simply an augmented pitch of respiration, to counter-vail a deficiency elsewhere.

Feeble respiration, on the other hand, is characterized by a diminution in the ordinary force of the vesicular murmur.

The former condition may depend on pleuritic effusion, on thick false membranes deposited upon the pleura or upon tumours interposed between the lungs and the thoracic walls; the other may be due to pleurodynia, stricture of the larynx, partial obstruction of one or more of the bronchial tubes, pulmonary emphysema, and phthisis in its primary stage.

The chief diseases in which a feeble respiratory murmur is heard are tubercles, emphysema of the lungs, and liquid effusion into the pleura. If the feebleness coincide

with unusual sonorousness of the chest, there is emphysema; with dulness, then either tubercles or pleural effusion may be predicated.

The absence of the vesicular murmur indicates a more extensive grade of one or other of the diseases above enumerated. But as it is rarely met with in emphysema or tuberculosis, it may, when confined to one side of the chest, be deemed a tolerably unerring sign of effusion into the pleura.

Respiration may be altered as to its rhythm. It may be *rare*, ranging from twelve to seven inspirations in the minute, as in several diseases of the cerebro-spinal system; or *frequent*, from thirty to eighty, as in numerous maladies of the chest or abdomen. Sometimes it is jerking as in asthma, pleurodynia, incipient phthisis, and chronic pleurisy. It may be long or short. Again, there may

be prolonged *expiration*, and this is indicative of two affections only, viz., pulmonary emphysema, or of tubercles in the crude state.

Respiration may be altered in character. It may be harsh and dry both in pulmonary emphysema and in incipient phthisis; when accompanied with arching and exalted sonorousness of the chest it betokens the former disease; when, on the other hand, it is attended with prolonged expiration, limited to the summit of the chest together with resonance of the voice and dullness on percussion, it indicates the latter. Respiration is said to be bronchial or tubular when augmented in intensity and elevated in tone. It occurs most commonly in phthisis, pleurisy, and pneumonia. It is termed cavernous when it resembles the noise produced by blowing into a hollow space; is usually perceived at the top of the chest, and nine times out of ten, denotes a cavern resulting from the breaking down of tubercles. Am-

phoric respiration is a kind of metallic resonance analogous to the sound evolved upon blowing into an empty jar; if well marked, it indicates pneumothorax with pulmonary fistula; otherwise a vast tuberculous cavity.

The preternatural sounds occasioned during the act of respiration by the passage of air into the air-tubes, and which mingle with the respiratory murmur and obscure it or replace it, are usually designated by the French word *râle*, or the Latin *rhonchus*. They have been classed under two heads, namely, the dry or vibratory, and the humid.

In the first class are comprised the two principal varieties of the sonorous *râle*, namely, the *shrill* or *sibilant*, and the *grave*. The former consists in a whistle, more or less shrill; the latter is characterized by a sound of a graver character, resembling the snoring of a person during sleep. These frequently alternate and replace each other.



They are indicative of a fleeting or permanent contraction in some portion or portions of the air-tubes, which is commonly referable to bronchial catarrh.

The humid râles include the crepitant, the sub-crepitant, and the cavernous.

The crepitant *rhonchus* conveys to the ear the sensation analogous to the sound produced by the crackling of salt when exposed to a moderate heat. It is to be discerned during inspiration only, and usually in the posterior and inferior part of the lung of one side. It is met with in pneumonia, œdema, and apoplexy of the lungs. As the two latter are comparatively rare diseases it is chiefly significant as being the almost pathognomonic sign of pneumonia during the stage of sanguineous infiltration.

The sub-crepitant or mucous râle is characterized by the larger size of the bubbles, and is like the sound produced by blowing through a pipe into a solution of soap. It

accompanies both inspiration and expiration, and is to be detected generally at the inferior and posterior part of the chest on both sides. It is pathognomonic of bronchitis in its second period, of phthisis just as the tubercles are beginning to soften ; also of bronchial dilatation, with excessive secretion, certain forms of pulmonary congestion, and apoplexy of the lungs.

The cavernous râle is distinguished by the bubbles being few in number, large, unequal, and conjoined with cavernous respiration. It is perceptible during inspiration and expiration, and usually circumscribed to the summit of one or both lungs. It reveals the existence of a cavity in the lungs, communicating with the bronchial tubes, or an inflated bronchial dilatation. When coincident with the cavernous voice, and seated at the summit of the lungs, it is the sure manifestation of a tubercular excavation.



Another variety which remains to be noticed, is called the friction sound. It is produced by the two surfaces of the pleura rubbing against each other when roughened by false membranes, or tubercular deposition. It is not unlike the rumpling of parchment, is usually jerking, and made up as it were of a succession of crackling noises. If heard exclusively at the summit of the lungs it might lead to the suspicion of tubercular pleurisy, but in the general way, is the index of pleurisy in progress of cure.

## II. *Auscultation of the Voice.*

1. The resonance of the voice is variously modified by disease. It is said to be bronchial (broncophony) when much more powerful than natural. Broncophony is remarkable for intensity, extent, fixity, and permanence. It almost always coincides with bronchial respiration. It commonly betokens pulmonary induration, proceeding from pneumonia

or tubercles, but is also met with in dilatation of the bronchial tubes, and in some cases of pleurisy.

2. The tremulous resonance (œgophony) is of a rather shrill and jerking character. It seems as if the individual spoke at times with a counter between the teeth and lips. It is generally heard on one side in the lower half of the depression below the scapular ridge, but may shift its position as the patient moves about. It almost uniformly coincides with feebleness or absence of the vesicular murmur at the base of the chest. If heard on one side and fever be present, it is evidential of pleuritic effusion; if on both sides without fever, but with general dropsy, of hydrothorax. When it originates during inflammation of the lungs, and shifts its position as above stated, pleuropneumonia exists.

3. The cavernous voice (pectoriloquy). Here, the vocal vibrations seem as it were

concentrated into a hollow space, the sides of which reflect to the ear the sounds more or less distinctly syllabled. It is generally restricted to the upper part of the chest, and coincides either with the cavernous râle or cavernous respiration. It denotes a tubercular cavity; more rarely, dilatation of a bronchial tube.

4. The amphoric voice is a hollow metallic resonance, similar to that produced in speaking across the orifice of a large empty pitcher. It generally coincides with amphoric respiration, and is indicative of pneumothorax, more rarely of a vast pulmonary cavity.

### III. *The Auscultation of the Cough.*

The cough offers the following characters: it may be bronchial or tubular, cavernous, or amphoric.

When the cough is tubular the ear experiences the sensation as if a column of

air were traversing a solid-sided tube with great noise, force, and rapidity. It occurs under the same circumstances as bronchial respiration, and is associated chiefly with hepatization of the lungs.

The cavernous cough consists in a reverberation more powerful, and at the same time more hollow than natural; and is attended by a peculiar impulse against the ear. It is decisive of a cavity in the lungs.

The amphoric cough is marked by a distinct metallic resonance, and pathognomonic of the same morbid changes as the amphoric voice.

Metallic tinkling is a sound similar to that produced by letting fall one or more grains of sand into a large metal cup. It accompanies the respiration and voice, but is generally most obvious during cough. It denotes pneumothorax, either by itself or attended with liquid effusion and fistulous communications of the pleura and bronchial

tubes. It may also denote a very large cavity in the lungs.

#### IV. *Auscultation of the Larynx.*

The respiratory sound of the larynx in the natural state is hollow and cavernous, the vocal resonance at its maximum; the cough communicates the sensation of the rapid passage of air across a void space.

In the case of disease the laryngeal respiratory murmur becomes harsh, and *grating*, as in the instances of acute and chronic laryngitis, or is replaced by a *whistling*, as in spasm or œdema of the glottis, in stridulous laryngitis, in some examples of compression of the trachea from foreign bodies; or by a sonorous cry in some cases of laryngeal ulceration, with considerable swelling of the margins of the organ and obstacle to the passage of air, or by a *snoring*, as in simple or stridulous laryngitis, in ulceration, laryngeal vegetations, &c.,

and, which frequently in croup presents a metallic sound.

In some instances the ear can discriminate a *cavernous laryngeal râle*, when, for example, the trachea and larynx are filled with mucus ; this râle may be circumscribed, and associated with the presence of mucus either upon an ulcerated surface, or around a foreign body detained in the ventricles, &c. Lastly, in some rare instances a *quivering* may be heard, denoting the existence of croup, with false membranes floating about.

There is another sign met with in a great number of affections of the larynx, cognizable, it is true, by auscultation of the chest, but which ought to be mentioned here, namely, *diminution or total abolition of the vesicular murmur*. This phenomenon is connected with every alteration which occasions a notable obstacle to the entrance of air into the air-passages, whether that obstruct or straiten the diameter of the tubes, (swelling,



inflammation, vegetations, adventitious productions, foreign bodies, &c.) whether that exercise compression from without inwards (cancerous growths, cysts, aneurism, &c.), or whether, in fine, it determine occlusion more or less complete of the superior orifice of the air-conduit, (hypertrophy of the tonsils, polypus of the nasal fossæ resting on the superior part of the larynx, &c.)\*

\* *Traté pratique d'Auscultation.* By MM. Barth and Roger. Paris, 1844.



**PART II.**



**OF**

**CATARRHAL INFLAMMATORY AFFECTIONS**

**OF THE**

**AIR PASSAGES.**



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CATARRH is a term familiar to most persons, as forming one of the first and most common affections of the mucous membrane of the air-passages, and often the first link to more active disease. It may be divided into acute and chronic. Again, a character has been given to it with reference to the part implicated. Thus, when, for instance, the Schneiderian membrane is the seat of the affection, it is often called nasal catarrh; when the lachrymal glands and tunica conjunctiva are involved, it is spoken of as a cold in the eyes;

and when the larynx and trachea are attacked, as a cold in the chest. These divisions, though unimportant, are nevertheless convenient when treating of the several affections of the air passages.

Acute catarrh is usually ushered in by a sense of fulness in the head, stoppage of the nostrils, tightness across the chest, and an uneasiness about the throat; slight cold, rigors, and headache; hot skin, thirst, a full and quick pulse, and general lassitude. After an indefinite period, but often within four-and-twenty hours, the disease will have established itself. Sometimes it is attended with a disordered state of bowels, amounting to diarrhœa; but more generally an opposite state of the system prevails, dependent on the feverish state of the body. The urine is high-coloured and scanty, often loaded with uric sediment. If, in the course of a few hours, the cold should determine to the nasal membrane, sneezing and defluxion ensue, a



thin, aqueous, and frequent discharge being kept up. After a few days the character of the secretion alters in appearance, diminishes in quantity, and assumes a viscid consistence; frequently, at the end of nine or ten days the affection subsides altogether. Great caution and care are necessary in preventing a fresh accession of the malady, and to which many persons are prone, from comparatively slight causes. Should the disease locate itself in the larynx, trachea, and bronchial membranes, the symptoms, in addition to those already enumerated, will be those of a sense of fulness in deglutition, cough, and uneasiness about the præcordia and upper part of the chest, familiarly complained of as a "rawness of the chest." Towards night the skin is hot and dry, the head aching, and much fever is often present. The secretion from the bronchial glands and membrane is at first scanty, but is soon increased, aggravating the cough both by reason of its me-

chanical irritation, as well as by its acrimony, resembling in some degree that met with in coryza. The tonsils are frequently affected, particularly in children of a lymphatic temperament.

It is well known that the surface of a mucous membrane is always moist in a state of health ; the exhalants are constantly pouring out a fluid which lubricates the membrane, but under certain conditions of the system this secretion may be partially or altogether suppressed, or so altered in character as to be scarcely distinguishable. In bronchial and tracheal catarrh the physical signs are easily recognised, where the case has been deemed of sufficient importance to need the aid of a physician. In the early stage a dry state of the membrane exists, as evidenced by a rhonchus loud and deep, and now and then sibilous. As the disease advances the character of the sounds is altered, the mucous rhonchus is heard throughout

the bronchial vessels, and much wheezing in the trachea.

*Treatment.* The treatment of acute catarrh consists in the early exhibition of a brisk purgative. Thus a dose of calomel with James's powder may be given at night, and an active cathartic the following morning. Febrifuge medicines, such as salines and antimony, are useful in small doses during the day, administered at intervals of from three to four or six hours, aided by a hot pediluvium at night, or a general warm bath. The room ought to be kept at a temperature of about sixty degrees, and diluent drinks given to determine to the skin and kidneys, followed by a stimulating liniment to the chest and throat, or a mustard poultice. The above procedure will generally suffice in the treatment of acute catarrh. The diet may consist of veal broth and light farinaceous puddings, barley-water for drink, or toast-water. At bed-time whey made



with milk and tamarinds, or hot lemonade, is a good diaphoretic. Boiling water placed in the sleeping chamber, and frequently renewed, by rendering the air moist, is often of great service where there is cough depending upon a dry state of the mucous membrane.

Where inflammatory symptoms manifest themselves, they must be met by local and general blood-letting according to the exigency of the case, aided by calomel, tartarised antimony and other medicines. A novel plan of cure, called the dry plan, introduced by Dr. Williams, may be mentioned here. Dr. Watson speaking of it, says, "It certainly has the merit of simplicity, for it consists merely in abstinence from every kind of drink; no liquid, or next to none, is to be swallowed until the disorder is gone. The principle here concerned is that of cutting off the supply of watery materials to the blood. The wants of the system exhaust

from the circulating fluid all that can be spared for the natural evacuations, and there is nothing left to feed the unnatural secretion from the inflamed mucous membrane. Its capillary vessels cease to be congested, the morbid flux is diverted, and the inflammation is starved away. Such is the theory." Dr. Williams says that the necessary privation is not ill to bear, and that it achieves a cure in about forty-eight hours. The Doctor allows, at the utmost, a table-spoonful of tea or milk for the morning and evening meals, and at bed-time a wine-glassful of water.

Chronic catarrh is often the sequel of the acute, kept up and prolonged by too early exposure out of doors by persons who are prevented, by various causes, from being able to nurse themselves. In such the affection assumes a settled form, is most troublesome and annoying, and attended by a loud ringing cough and a thick viscid

secretion from the mucous membrane, without, however, any concomitant fever, and scarcely any constitutional disturbance. Attention to the bowels, a light and nutritious diet, keeping the surface of the body warm, and avoiding exposure to sudden vicissitudes of temperature, are all that is necessary to be observed in this catarrhal affection.

There is another type of catarrh, called *catarrhus senilis*, from its attacking old people, and which is very prone to merge in pneumonia. It is attended by shortness of breathing, and suffocative cough: the membrane is congested. Laxatives and expectorants, warm local applications to the upper part of the chest, and all those measures which determine to the skin and kidneys should be had recourse to. A strict and watchful observance of all inflammatory symptoms is especially necessary.

*Bronchitis.*

This is a disease of more serious import than the catarrhal affections that have been considered, and yet in some of the symptoms nearly allied. A simple catarrh, in the first instance, may quickly merge into bronchitis.

This disease, too frequently, is the pioneer or forerunner, of many of the graver affections occurring within the chest, and which owe their origin primarily to the inflammatory condition of the mucous membrane of the lungs. Hence the importance of its early recognition and prompt treatment by the medical attendant. It is idiopathic and symptomatic. It is more frequently present than absent in pneumonia, complicated also with pleurisy, and very commonly observed in the eruptive fevers of children, and particularly so in gastric fevers, where the gastro-intestinal mucous membrane is in a state of high irritation. It is no re-



specter of ages or constitutions, attacking the infant at the breast, as also the very aged, with whom it is most fatal. There are various types and degrees of this disease. A mild attack, passing off in eight and forty hours, and scarcely attended with any constitutional disturbance; while the more severe and aggravated form will be accompanied with symptoms the most distressing and alarming,—the whole system being prostrate under its influence.

*Acute bronchitis*, inflammation of the bronchial mucous membrane, is a disease of a very serious character; for the deeper it extends into the minute divisions of the bronchial tubes, the greater is the danger. This malady is generally ushered in by chills and headache, pains more or less extending over the muscles of the upper part of the trunk, particularly those of the spine and lumbar regions; the skin is hot and dry, the pulse quick and often rather sharp; the tongue is

coated with a thick dirty fur; a sense of pain is soon experienced at the sternum and upper part of the chest, and a feeling of rawness or scalding in the lining membrane of the throat. Added to these there is a peculiar dry cough unattended with secretion at the onset, but presently followed by a thin glairy fluid resembling albumen or white of egg. The countenance assumes a dusky hue, and dyspnœa is more or less urgent. In acute bronchitis many of the symptoms are analogous to those of acute pneumonia, but more violent, because the entrance to the air-cells is obstructed. The pain is dull and pricking, and is oftener rather a feeling of soreness than of absolute pain. It is referred to the back of the sternum, and is increased when the patient holds his breath after a deep inspiration. The fever is at first inflammatory, with a quick, full, but not hard pulse. Prostration, however, with a compressible pulse and livid

countenance, come on sooner than in pneumonia, for the impediment to decarbonization of the blood is greater. Dr. Stokes (no mean authority) says, "I have long observed that lividity is much more an attendant on severe bronchitis than on pneumonia with hepatization, or even pleurisy with copious effusion; this I do not put forward as a novel observation, but may remark that it strengthens the opinion that the aërating power resides more in the bronchial ramifications than in the air-cells." The dyspnœa here is more intense, the cough more spasmodic, the countenance more livid and congested. The mucous secretion, is at first checked, but after a few hours is restored, and has a viscid ropy appearance, sometimes streaked with blood, ultimately becoming opaque, pearly, or even mucopurulent, yet independent of ulceration of the membrane.

*Physical signs of acute bronchitis.*—The



physical signs of acute bronchitis may be conveniently considered under three heads; 1st, the signs that are likely to result from percussion, 2nd, those from auscultation, and 3rdly, those discoverable from manipulation or touch. What, if any, are the signs made out on carefully sounding the walls of the chest? In the earliest stage of acute bronchitis it must be confessed that percussion will afford little or no aid to the explorer in arriving at any satisfactory diagnostic views regarding bronchitis; the reason is obvious, for as yet the mucous membrane has scarcely undergone any change of character, beyond vascular turgescence, and even in the more advanced stage unless a large amount of thick mucus which (with the vascular and thickened state of the membrane) is filling up the tubes, percussion will fail to elicit any abnormal sounds. But after an indefinite time, probably forty-eight hours, when a

copious secretion has set in, filling to a great extent the large and smaller bronchial tubes, or in a more advanced stage of the disease, when there is a free muco-purulent secretion, it is possible dulness to a greater or less extent may exist, this fact is so far satisfactory that it shews the idiopathic the uncomplicated nature of the attack, more particularly with reference to tubercular deposit.

*Auscultation.* By this method of diagnosis a degree of certainty is arrived at of great practical importance in the management and treatment of bronchitis, and the one chiefly to be depended on. At the onset of the attack all secretion is more or less interrupted, and a dry state of membrane exists, and on applying the stethoscope in the open post-clavicular and axillary spaces a râle is heard dry, harsh, tense, and loud, often modified in degree and force, so much so, as occasionally to be conveyed to the ear in the merest whisper, scarcely audible,

showing the tubes to be spasmodically affected. As the disease advances and active secretion follows, there is first a fine mucous râle more or less diffused corresponding in extent with the bronchial tubes affected, sonorous rhonchus follows after an indefinite period, and then a full free mucous rhonchus supervenes. In the lower parts of the lungs the rhonchus is often sibilous, more particularly when a congested state of the minute vessels would indicate impending inflammatory action.

The physical signs observable by manipulation or touch are a sense of vibration on applying the hand over the part affected, but this is only observed when there is intense mucous rhonchus and the walls of the chest not covered by strong pectoral muscles, hence it is more plain in the child and female than the male adult, and will often disappear after a severe fit of coughing,



when a large quantity of mucus has been expectorated.

Dr. Stokes, in his valuable work on diseases of the lungs, mentions, among other physical signs, "the complete suspension of any sound of respiration in certain parts of the lungs; in most cases this phenomenon is but temporary, but it may be permanent; in the first instance it will often disappear after a fit of coughing, a circumstance which Laennec believed to depend on a temporary obstruction by mucus, but it is possible that spasm may have some effect in producing it."

*Treatment of acute bronchitis.* It will be readily surmised from the preceding history of this disease, that the treatment must be prompt and active. Bleeding general and local will be required; if the patient is of a robust habit and in the full vigour of life, with a strong hard pulse, accompanied by

active fever, twelve or fourteen ounces of blood may be drawn from the arm, and as a general rule it has been observed, that the greater the toleration of blood-letting the greater the necessity for it, but after all, the pulse will be the best guide regarding the quantity to be abstracted, care being taken not to reduce the patient's strength too suddenly, lest impending suffocation should supervene, remembering that the bronchial tubes are already clogged with thick mucus and that a certain amount of power will be necessary to clear them, for in the event of sudden syncope the life of the patient would be in imminent peril, and jeopardised by the very means intended to relieve. The application of cupping glasses over or near to the seat of the affection will be of service. The bowels should be thoroughly unloaded by a brisk cathartic of calomel and colocynth followed up by a draught of senna and tartrate of potash. Afterwards tartar emetic

will be found one of the most useful agents in subduing inflammatory action, more particularly that connected with the respiratory organs; such doses must be apportioned that will keep up a certain amount of nausea just short of actual sickness. Calomel also must be reckoned among the essentials in the treatment of acute bronchitis. Warm baths, and diluent drinks to determine to the skin and promote a copious flow of urine are the usual remedies resorted to for cutting short the disease. Mustard poultices and stimulating liniments are useful topical auxiliaries. Many practitioners have warmly advocated the use of colchicum in the treatment of bronchitis, while others again have called in question its efficacy: some reckon it as almost a specific, while others of repute after giving it a fair trial, have entirely discountenanced its use. It is just probable that the partizans for colchicum have administered it in conjunction with calomel

and tartar emetic, after previous bleeding, and have assigned the result to the colchicum, which should have been partly awarded to the other remedies. Opium has been condemned in the early stage of bronchitis, from its tendency to check the secretion of the mucous membrane. Prussic acid in small doses, or benzoic acid in almond mixture, or with comp. tragacanth powder, will often allay the spasmodic cough and procure rest. Should much dyspnœa accompany the attack of a spasmodic character, a combination of small doses of extract of stramonium with the extract canobis Indicæ will often procure relief. After a favourable impression has been made on the disease by the active remedies above mentioned, the hyd. c. cretâ with ext. of henbane or lettuce, or comp. conium pill with a little squill, may be given two or three times a day, to promote secretion and relieve the hepatic congestion, which is



often coincident with bronchitis. As the patient recovers, a mild tonic, with ammonia and nitric æther may be given two or three times a day. The diet should be strictly antiphlogistic, and the ordinary drink, toast-water. Imperial or whey will prove a grateful and refreshing beverage. Should the patient be residing in a cold bleak situation, removal to a warm and dry residence, sheltered from the north and east, should be effected if practicable.

The treatment of the mild type of the disease, is very simple, the practitioner, having first satisfied himself that the irritation of the membrane is slight and the absence of fever re-assuring him of the state of his patient, the breathing only slightly disturbed, and the wheezing loose, an active aperient should be first given, consisting of three or four grains of calomel in combination with James's powder, at bedtime, followed in the morning by a cathartic

purge; a cough mixture with citrate of ammonia, antimony, and a little squill, may be taken every four hours, confinement to the bed-room for a day or two, or the bed, a diet of farinaceous slop or very weak broth, veal or chicken, will effect convalescence in a few days.

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*Chronic Bronchitis.*

This affection, though of less serious nature than the preceding, is entitled to some notice. The general symptoms are mild when compared with those of the acute form. It is distinguished from the other by its gradual advance, the absence of fever, the mucous character of the expectoration, and the habitual cough. It is often the sequence of acute bronchitis.

The physical signs of chronic bronchitis are not so well or truly marked as those of many of the varieties of affections of the



mucous membrane, but sufficiently so to distinguish it from other disease of more serious import. The movements of the chest are natural, and percussion does not elicit anything particular; the respiration and cough are attended with modifications of rhonchus, the sibilous, the crepitant, and the dry and moist sounds are frequently heard. Respiration is perceptible through every part of the lungs. The expectoration is more thick and opaque than in the acute disease; it varies also in quantity, being more profuse in the early part of the day, and diminishing gradually towards the night.

The anatomical characters are redness of the membrane, and where the disease has existed for any length of time, a thickening of the same; this is frequently the case in old people. The smaller glands, at the bifurcation of the trachea, are enlarged, and the lesser bronchial tubes are dilated to a

considerable extent, and sometimes their surface is ulcerated.

Certain medical authors speak of a softening of the membrane. That such a state of membrane does exist occasionally there can be no doubt, but it is not a very frequent occurrence. A beautiful illustration of this may be seen in the magnificent plates of Dr. Carswell. Where the bronchi are dilated to any considerable extent, the neighbouring part of the lung is compressed around the vessel. This, on percussion, would give a slight impression of density, and, if very considerable, the ear would miss the respiratory murmur which ought to be audible over every part of a healthy lung. A dilated state of bronchi, with expectoration of a puriform character, has often been mistaken for phthisis pulmonalis, particularly when over the large dilatations you perceive a mucous rhonchus simulating that of phthisis, and more especially when pectoriloquy is

also to be heard at the same spot. Dr. Williams assigns, as the physical cause of the dilatation of the bronchi, "the combined acts of respiration and cough exerting a degree of pressure on the softened membrane greater than its elasticity can resist." The predisponent causes of this disease are a cold damp season, with great and sudden variations of temperature, with a low state of the barometer. It is frequently met with in old people; in those of broken-down constitutions, much exposed out of doors; in persons, again, whose work is principally carried on in the open air, and who are often ill provided with warm clothing, and, when wet to the skin, unable to change their clothes; as also in those of intemperate habits. A sudden check, indeed, given to the cutaneous function by cold damp weather, will produce not merely bronchitis but diarrhœa, and a host of congestive affections of the mucous membrane. Mechanical irritation is a very

fertile source of this form of disease, as is observed in those persons who are employed in factories. Wool-carders, leather-dressers, needle-pointers, stonemasons, millers, and many others, are very prone to this disease. The symptoms that generally present themselves will be a cold shivering state of the surface, pulse full but compressible, the countenance pale and sometimes congested, cough, slight dyspnœa, the bronchi obstructed by viscid ropy mucus; the mucous rhonchus becomes distinct, with much wheezing, as the disease advances. The regeneration of the blood being prevented, there is great prostration, swelling of the feet and ankles, coldness of surface, lividity of complexion, and much dyspnœa. Lastly, when lymph is deposited in the subcutaneous cellular tissue of the bronchi, the sonorous râle is discernible.

*Prognosis.*—The prognosis here must depend upon whether the disease is simply



chronic and uncomplicated with organic affections in other parts, and on the previous state of the constitution. Should the presence of tubercles be indicated, and hectic fever, great prostration, loss of flesh, supervene soon after an early attack, a fatal termination may be expected. In cases not complicated with organic disease elsewhere, the affection may prove fatal in persons of delicate constitutions or advanced in years, from the wear and tear of the frame, the loss of rest at night, and the unceasing calls to expectorate; the heart sooner or later becoming involved, from the mechanical obstruction offered to the propulsion of the blood through the affected lung.

*Treatment.*—In the treatment of chronic bronchitis blood-letting is not generally admissible; the local abstraction of blood by a few leeches, or by the cupping-glass at the posterior part of the chest, between the scapulæ, is occasionally proper; but the expe-

diency for depletion will of course depend on various circumstances, such as the age of the patient, the previous strength of the constitution, and the habit of body, whether of the cachectic or vigorous character. Whenever blood-letting is requisite, the quantity should not exceed six ounces, and very often three or even two ounces will suffice, and that by cupping. As regards leeches, probably half-a-dozen will be enough, great care being taken in children of a tender age to stop the leech-bites as soon as the desired quantity has been abstracted. Many a child has been sacrificed from over-bleeding, because some very vague or general directions only have been left with the nurse or parent. Where the case is critical, the medical attendant ought not to leave the house until all bleeding has ceased. A simple and never failing plan to arrest the hæmorrhage is to pass a fine needle and thread across the leech bite, tie a knot, and



cut off the ends. This mode of suppressing bleeding will apply also to the wound in the jugular vein when it has been opened, and is far preferable to any other plan. Counter-irritation is a valuable auxiliary in chronic bronchitis. Blisters have been objected to ; but the abuse rather than the use is detrimental. A small blister applied over the upper part of the sternum for six or eight hours, and then removed and dressed with a stimulating ointment, as that of savine, and kept freely discharging, is often of signal service.

A speedy blister may be procured by painting over the part intended for vesication by the acet. cantharidis. The same means may be applied to the posterior part of the chest, between the scapulæ and spine as the case may be. Stimulating embrocations, such as the ol. tigli, ʒi. lin. camp. c. ʒiiss., conjoined with turpentine or cajeput oil, prove good counter-irritants in these chronic affections. The internal remedies

consist mainly of those which tend to restore the diseased membrane to its normal condition; for this purpose the hyd. c. cretâ, with comp. conium pill, or small doses of squill, night and morning. Mild aperients and diuretics will be occasionally required; and after a favourable change, light tonics will be borne very well. The influence of all sudden changes in the atmosphere should be guarded against, and the body well protected by warm clothing. Flannel should always be worn next the skin, and the preference given to a sheltered residence, with a bed-room facing the south or south-west. Hot crowded rooms and chapels and churches during evening service especially should be avoided. The diet should be light and nourishing, with a sparing allowance of animal food; at first fish, poultry, farinaceous puddings, may be taken in moderation, with occasionally a little sherry and water or bitter ale as a beverage. Sponging

the throat and chest daily before breakfast, with equal parts of vinegar and cold water, will tend much to impart a healthy tone to the surface of the chest, and render the individual less liable to take cold from slight causes, particularly in the spring and autumn.

There is another state of the bronchial membrane fully described by Dr. Watson, Mr. North, and others, and easily recognised by the character of the expectorated matter, which is often detached and brought up by coughing, and resembles the appearance of false membrane, as seen in croup; sometimes it is arborescent, being a cast, so to speak of the ramifications and divisions of the bronchia. Dr. Watson likens this product to bunches of worms or to the roots of a plant; and Dr. Warren, in a paper written upon the subject in the "Medical Transactions," has figured the same under the designation of bronchial polypi. Bronchial



hæmorrhagesometimesattends the expulsion of these substances; but the spitting of blood thus occasioned must not be confounded with the hæmoptysis from phthisis and tuberculous diseases, although in some instances it may be complicated with these affections. Dr. Watson tell us, that "in hæmoptysis depending upon tubercles in the lungs, or organic disease of the heart, these concretions are very rarely observed. I have never seen them, however common such cases are." Dr Mason Good, in the second volume of his "Study on Medicine," speaks of this peculiar affection under the term of "Bronchlemnitis chronica;" and, chiefly on the authority of Dr. Warren, who has given the name of polypi to the concretion thus coughed up, Dr. M. Good starts an objection to this term, inasmuch as it may lead to serious mistakes as it imports the febrile secretion, which exists as a characteristic of this disease. The learned

writer also cites the names of Bartholine, Tulpius, Ruysch, Goetz, and Morgagni, who have all, it would seem, given examples of this affection. Hence it is very evident that the disease was known to ancient writers. But Dr. Warren, it is certain, was the first to give a clear and succinct account of it. In his opinion the concretion was the result of mucus secreted by the glands of the bronchial vessels; but, as Dr. Mason Good says, "the existence of fibrin, as a constituent part of the blood, was unknown at the period at which he wrote, and his plates and description of the membranous matter expectorated show evidently that it was composed of this formative element, intermixed with gluten secreted in layers, and affecting a tubular structure." The treatment of this affection would necessarily embrace much that has been embodied under the head of acute and chronic bronchitis. Inflammatory action must be ob-

viated by blood-letting, followed by calomel, tartarised antimony, and expectorants, to facilitate the evacuation of the false membrane. These, along with diluent drinks, and an antiphlogistic regimen, kept up for some time, will (provided there is no co-existing disease) tend to effect a cure.

Affections of the bronchia are well known to co-exist with those of the heart. Acute bronchitis and pericarditis are frequently coincident, and not confined to the pericardium, but involving the substance of the heart, its valves, and lining membrane. Where dropsy has supervened after chronic bronchitis and other affections of the air-tubes, it has generally been found, on dissection, that the heart has been diseased. Bronchial inflammation and congestion are seen accompanying or following many of the exanthemata, and often prove troublesome and dangerous.

There is another form of bronchitis, de-



scribed by authors as *peri-pneumonia notha*, the asthenic or humid form of bronchitis. The distinguishing mark of this affection is to be found in the mucous rhonchus which is always present. There is a distressing wheezing attended with regular exacerbations of fever, hot skin, headache, dyspnœa, and thirst. This form of disease, as has been previously stated, prevails most in old people of a relaxed habit of body, who are subject to chronic cough in winter.

The causes that predispose to an attack of bronchitis, as well as to many of the inflammatory affections of the mucous membrane lining the air passages, are referable to the sudden changes of temperature of this climate during the winter and spring months. Mild open weather, with west and south-west winds, the thermometer probably fifty out of doors, and then the wind suddenly shifting to the north-east, lowering the mer-

cury to thirty or even five-and-twenty degrees, and this in the course of twelve hours, are circumstances in themselves sufficient to explain many of the inflammatory attacks so constantly met with. Exposure to wet and cold, strong currents of air with wet clothes on, perspiration too suddenly checked after violent exercise, prematurely leaving off flannel or warm articles of under clothing, are common causes of an attack of bronchitis.

The treatment of this form of bronchitis, occurring as it does generally in old people, often suffering under constitutional debility, from advanced age and other causes, requires much careful consideration and watchfulness on the part of the medical attendant. External stimulants to the chest, such as a mustard poultice or a warm stimulating embrocation, composed of *olei terebinthinæ* ʒss. *lin. camphoræ* C. ʒi., *olei lini* ʒij., will prove of great service. The medicines necessary are rather different from those used

in active bronchitis. Tartarised antimony, from its prostrating effects, should be avoided, or given only in very minute doses. A useful mixture for allaying the irritation of the mucous membrane is, infusi lini comp.  $\mathfrak{z}$ iv., mist. acaciæ  $\mathfrak{z}$ iss; tinct. camph. C.  $\mathfrak{z}$ ij., syr. tolu  $\mathfrak{z}$ ss., and liq. potassæ gutt. xl; of this a fourth part may be taken three times daily; a pill at night with hyd. c. cretâ, pil : rhei C. and ext. conii or ext. hyoscyami, will regulate the secretions and procure sleep. Change of air to a milder but not humid locality, and a tonic plan of treatment should be pursued. The strength of the patient should be well supported by good beef-tea, nourishing broths, jellies, &c.

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*Laryngitis.—Inflammation of the Larynx.*

The sthenic form is active inflammation of the mucous membrane, and of the parts

composing the larynx, including also the epiglottis, and frequently extending to the posterior fauces and soft parts adjacent, embracing the velum palati, tonsils, &c. Cynanche laryngea is a disease of a very formidable character, requiring the most prompt measures, often running its course in a few hours to a fatal end, in spite of the most energetic treatment.

The symptoms of acute laryngitis may be said to commence with a sense of constriction and uneasiness about the fauces and tonsils, rigors, headache, followed by pyrexia, husky convulsive cough, hot skin, pulse full and hard, flushed face, difficult deglutition, great restlessness, with anxious countenance. The voice is hoarse and unnatural, sometimes interrupted to a mere whisper, from the implication of the chordæ vocales. There is sympathetic cough of a spasmodic character, at first dry and sonorous, but

afterwards accompanied with mucous secretion. There is also more or less dyspnoea arising from the dry and tumid state of the membrane narrowing the passage, as also from the irritation being extended to the muscles of the larynx, which are spasmodically affected. There is, moreover, great tenderness on pressure over and on either side of the larynx; delirium often follows, and the patient dies asphyxiated. In looking into the throat the fauces will be seen red and inflamed, and by pressing down the tongue the epiglottis may be descried of a bright scarlet colour.

*Diagnosis.*—This disease can hardly be mistaken for or confounded with any other. It is distinguished from œdema of the glottis by the freedom of expiration in the latter, the absence of fever and constitutional disturbance, the slightrness of the pain, and the facility of swallowing; also by the absence of any degree of redness or



augmentation of bulk, and by the infiltration of serum or seropurulent fluid in laryngitis. It is distinguished from cynanche tonsilaris and cynanche pharyngea, by the non-existence in both these diseases of the stridulous breathing, and the presence of fever of a typhoid character, and the ulcerated surfaces in view; but from croup the distinguishing features are not so plainly marked, and it is possible for a person who had not seen much of acute laryngitis to mistake it for croup. It may be distinguished from croup, however, by a constant and voluntary effort to expectorate. The secretion, moreover, is rather viscid and mucous than of a membranous character. Dr. Cheyne remarks, "that though both the diseases are inflammatory, in that point alone they resemble each other." Croup is a disease occurring before puberty, generally affecting not merely the larynx and trachea, but the bronchial membrane, also ending



in an effusion of lymph on the free surface of the membrane. Acute laryngitis is rare in childhood.

*Prognosis.*—Of all inflammatory affections laryngitis has been considered the most formidable and fatal; and when the function of the larynx is considered in its twofold character both as the organ of speech and voice, and as the inlet to the lungs, the risk of danger is obvious. Pathologically speaking, we have here active inflammation of the mucous membrane, as shown by the redness and injected state of the membrane, together with an œdematous state of the submucous tissue, and serous effusion into the surrounding cellular tissue.

*Treatment.*—In the first stage, while the pulse is strong and full, blood-letting must be had recourse to, and the other remedial means for arresting inflammatory action, viz., calomel, opium, and tartarised antimony, must be given in full doses every

two or three hours, and no time lost in quickly bringing the system under the influence of the mercury. It must be borne in mind that it is in the early stage of inflammation that these measures avail; for effusion ere long supervenes, and they are then worthless. The period for action is a short one, admitting of no delay, the safety of the patient wholly depending on vigorous measures. If, after an interval of six hours, the intensity of the disease shall not have yielded, recourse must be again had to the lancet. As regards counter-irritants a difference of opinion exists. Some medical men recommend blistering over the seat of the disease, while others have contented themselves by applying a blister to the posterior part of the neck. The parts involved are so superficially covered by skin and integument, that serous effusion has followed the application of a blister over the part affected, and consequently the disease has

been thereby aggravated. Leeches even produce so much irritation as to make it a question whether they do not occasion more harm than good. Warm linseed-meal or bran poultices, frequently renewed, have been found serviceable. If the stage for general blood-letting shall have passed, then leeches should be applied on either side of the larynx. If all these remedies fail to arrest the disease, and the patient's life is in jeopardy from impending suffocation, which may be ascertained by the great distress, dyspnœa, livid and bloated countenance, the operation of tracheotomy ought forthwith to be performed. The immediate danger is of a mechanical nature, namely, the air is prevented entering the lungs, owing to the passage through the larynx being obstructed. An operation, therefore, offers the only chance of saving life; and this ought never to be delayed until the patient is so far gone as to render the procedure nugatory.

Mr. Lawrence, in his lectures delivered at St. Bartholomew's Hospital, has given so clear and simple an account of this operation, that I have taken the liberty to transcribe it. He remarks, "We sometimes cut people's throats professionally, but then we give to the operation the better-sounding term of tracheotomy, laryngotomy, bronchotomy. We make an opening into some part of the respiratory tube for the purpose of liberating the patient from the distress which interruption of respiration produces, whatever the cause that produces that impediment in breathing may be; we make an opening into that part of the trachea which is immediately below the larynx, by cutting in the interval between the cricoid and thyroid cartilages; there is in that situation a considerable space filled by a tough yellow ligament; we make a transverse division through that ligament, and thus get such an opening as is neces-

sary for respiration. More commonly when making an opening into the respiratory tube, we perform a perpendicular division of the upper part, first through the skin and soft parts, and then through the cartilaginous rings immediately below the cricoid cartilage." This opening may be conveniently kept open by means of a small tube of silver, which is made for the purpose, having at one end a flat surface resembling the common shirt stud : from time to time this may be cleared from any accumulation of viscid mucus that may be filling up the aperture. As soon as the inflammation of the larynx has subsided, the tube may be withdrawn, and the artificial opening closed. This operation applies to all affections of the wind-pipe, where the seat of mischief is above the trachea, whether resulting from inflammation—the introduction of a foreign body—from injuries inflicted through the medium of scalding water—from irritant

gases, or for the purpose of removing any foreign body that might accidentally be lodged in the bronchia. The causes that produce acute laryngitis, are exposure to wet and cold—a damp state of the atmosphere, with a low barometrical pressure—lowering passions, and great mental and bodily fatigue. Others of a mechanical character might be mentioned, such as those arising from injury—drawing in scalding fluid from the mouth of a tea-pot or tea-kettle, as happens to children; the corrosive action of poisons, and noxious gaseous fumes; laryngitis is likewise a sequel of many of the exanthemata, small-pox, measles, scarlatina—as also of cynanche pharyngea, and hooping cough.

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*Chronic Laryngitis.*

The larynx is subject to subacute inflammation, thickening of its cartilages, with



ulceration, and is of very common occurrence. The anatomical characters are: a thickened indurated state of the larynx and parts adjacent, ulceration and necrosis of its cartilages; ossification is often met with. The ordinary symptoms are, a dry husky cough, hoarseness, aphonia, or diminution of the voice to a mere whisper—pain and tenderness externally, and often preternatural enlargement of the part. After the disease has existed some time the expectorated matter is of a muco-purulent character, and very offensive. It is frequently connected with phthisis—and creeps on insidiously. At first, the inconvenience is so slight as scarcely to attract attention, until the aggravation of the local symptoms induces the sufferer to seek for relief. The disease may exist for months, and with but trivial inconvenience or derangement of the general health: clergymen are often the subjects of a mild form of laryngitis—sometimes

designated "clergyman's sore throat." Long and continued speaking, or reading, at a time when labouring under the effects of a severe cold, or an impaired state of health, predisposes to this affection: but the class of persons with whom this disease is most common, are cab-drivers, porters, bargemen, and others, necessarily exposed, by their avocations, to all weathers, by night and day. They are seen in numbers, as patients, in the wards of hospitals and at public dispensaries. The cause of this disorder has been partially stated under the head of Acute Laryngitis, of which it is often the sequel, as above mentioned. Persons of intemperate habits, who indulge in the free use of ardent spirits, or of broken-down constitutions, and such as have been often mercurialised for venereal disorders, are often the subjects of chronic laryngitis—individuals, after forty years of age, are more prone to it than before that period.

*The Treatment.*—In the earlier stage, when the voice is only slightly affected, and but little cough or tenderness present, a removal to a warm dry situation is desirable; a few leeches occasionally applied; and a mild course of mercury, persisted in for some time, should there be much dyspnœa with spasm, small doses of camphor conjoined with æther and opium will be necessary, medicated inhalation should likewise be used. Counter-irritation by blister or otherwise, and the application daily of a strong solution of nitrate of silver, by a sponge applied to the fauces, and eventually a course of sarsaparilla, will prove of great service. All exertion of the voice should be carefully avoided, and the parts kept at rest as much as possible.

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*Tracheitis, Cynanche Trachealis, Croup.*

According to Laennec, it would appear that this disease was unknown to the Greek

and Arabian physicians, a circumstance not to be wondered at, since it must have been of rare occurrence in the temperate or warm regions they inhabited: the same author also states that Ballonius, in 1576, first mentions this disease, but it is more than probable that physicians of an earlier date were acquainted with it. The particular merit is due to Ballonius for having been the first to describe the false membrane in the larynx and trachea. Laennec further states, that the first exact description of the disease was supplied by Ghisi. Sir John Forbes, in his valuable translations of Laennec, gives the credit to Dr. Holme, who, he says, gave the first good account of the disease in 1765; another kind of croup, designated false, and which will be considered hereafter, is a distinct affection, now familiarly known as *laryngismus stridulus*. Croup is inflammation of the mucous membrane, lining the air-passages,

principally the trachea; (hence the name "trachealis;") and from which, in a few hours, an exudation of lymph ensues, filling up the narrow passage, and attended with fearful loss of life: after death, various lesions will be found corresponding to and indicating the results of inflammatory action; and although the disease may be said to have expended itself in the trachea, other parts of the throat will be found sympathetically implicated: for instance, the larynx and pharynx. It is said, however, that in children it seldom extends beyond the glottis, while in adults it will frequently originate in the tonsils or pharynx, and extend thence to the wind-pipe. This disease is very often complicated with pneumonia and bronchial inflammation which is sometimes overlooked. The peculiarity attending the exudation of lymph in the mucous membrane of the trachea is, that it immediately forms a concrete substance



lining the membrane, and hence the imminent danger of suffocation. Laennec calls it plastic pus. On the separation of this membrane, the parts beneath exhibit a bright red appearance, proving the extent and character of the inflammation; the throwing off this membrane partially, or wholly, is an effort of nature to get rid of the mischief, and bring about a cure; a perfect cylinder of membrane is often evacuated by vomiting, or the effort in retching, or by the violence of the spasmodic action accompanying the effort to dislodge a foreign body. Where death ensues without this substance being dislodged, it will be found firmly adhering to the whole of the trachea, and dipping far downwards into the bronchia. From the peculiar termination in the formation of the adventitious membrane above-named, the inflammation has been supposed to be of a specific character. Dr. Hope believed the exhalants



of the mucous surface to be particularly affected. Laennec has called this plastic inflammation, and John Hunter conceived the inflammation to be of an erysipelatous or unhealthy character. The symptoms of croup, the first and early symptoms, are often catarrhal. They may be preceded, for a few days, by slight indisposition, or may occur suddenly, and, as is often the case, at bed-time, or the middle of the night, in which case, the nurse, or mother, is awakened by the child making an unnatural sound in breathing, accompanied by a cough of loud and ringing character. In an attack of croup, all the general inflammatory symptoms are present—hot skin, hard quick pulse, flushed countenance, with much general disturbance and restlessness; but the distinguishing feature of the disease is, great oppression of the breathing accompanied by sonorous and stridulous inspiration: this serves at once to indicate the

malady, and to apprise the parents, or nurse, of the impending danger. Indeed, the peculiar rough metallic ring of the cough, and crowing inspiration, once heard, can never be mistaken or forgotten. If the disease proceeds unchecked great prostration and failing of the vital powers follow rapidly. The pulse is feeble and intermitting, the countenance pale and anxious, the skin moist and cold. This disease is generally one of early childhood; when it attacks adults it is usually of an asthenic character. It mostly attacks strong plethoric children, from the ages of one to seven years, after deciduous teething. In the treatment of croup, the only chance of saving life, is by prompt and vigorous measures: viz., blood-letting, general and local, calomel and tartarised antimony. Touching depletion, Dr. Cheyne says, "As to the question of bleeding in croup, when the disease is once established no doubt

ought to exist, unless perhaps we may hesitate as to its stage. If the patient is in the first or inflammatory stage, no experienced physician will omit bleeding—if in the second, or that of suppuration, no physician will propose it; if it were doubtful to which stage the symptoms belonged, it would be preferable to bleed. In the onset, in a child about three or four years old, the jugular vein might be opened, and one ounce of blood for every year of its age should be abstracted, leeches applied to the larynx and trachea; an emetic should be given early—it should precede the bleeding; afterwards small doses of tartarised antimony should be persisted in, with calomel, from two to three grains, according to the age of the child, every three or four hours; a warm bath at eve, which will aid by determining to the skin and mucous membrane." Dr. Paris says, "That under the concussion of vomiting, the stomach

will be cleared out of irritant matter, and blood will be determined to the surface; but as nausea and depression follow the action of the emetic, the heart's action will be subdued, the capillaries relaxed, and a tendency to secretion from the skin and mucous membrane will be set up; the calomel should be given freely until large copious green stools come away." Dr. Hamilton, the late professor, of Edinburgh, chiefly depended on the use of calomel in the cure of croup, which he considers to have a specific effect. In the second stage of the disease, when the inflammation has become subacute, a blister at the back of the neck will be useful, but it should be kept on three or four hours only, to act merely as a rubefacient, for the fear would be that in a low state of vitality, a troublesome sloughing sore might be set up. If, in spite of active treatment, an adventitious membrane should have formed, calomel



should still be given in small doses, with the view of promoting the detachment, not the absorption, of the membrane. In the advanced stage, with a weak failing pulse feeble respiration, and pale countenance, stimulants are to be given : wine, and ammonia : the Senega root, in the form of decoction, combined with squill, will prove a useful medicine. When suffocation is threatened, and the flapping of the partially detached membrane is heard, an emetic of from eight to ten grains of sulphate of zinc should be administered. Thus portions of the membrane will be forced through the glottis under the concussion of vomiting, and immediate relief follow. Lastly, should the patient be in extreme danger, the trachea ought to be opened about three quarters of an inch above the sternum, by dividing the integument in the median line, avoiding the thyroid plexus of veins, after which, two or three rings may be cut across, and a small

canula made for the purpose introduced, taking care from time to time to keep it free from blood and mucus.

Another affection of the windpipe, which in some respects simulates croup, may be now mentioned, viz., *Laryngismus stridulus*, or the crowing inspiration of young children, occasionally described as spasmodic croup. This affection is the immediate result of spasms of the muscles, which close the *rima glottidis*, especially the *arytenoidei obliqui transversi*. But here the irritation of the larynx is secondary, and there always exists some primary irritation in the system, either depending on worms, dentition, or disordered *primæ viæ*. Dr. Marshall Hall has made this disease a beautiful exemplification of the reflex function of the nerves. According to him, there are five essentials necessary for the perfect performance of a reflex action 1st, An irritant; 2nd, an incident nerve to convey that irritation to the



excito-motor tract, which Mr. Grainger has demonstrated to exist in the grey matter of the spinal chord; and has even traced filaments distinctly from it, to each pair of spinal nerves; 3rd, integrity, that is to say, an entire or sound state of the cord and medulla oblongata, that the reflex action may be perfect; 4th, a reflex nerve or nerves to propagate that irritation, secondarily, to other organs; 5th, and lastly, integrity, or a sound state of the muscular fibres, which are secondarily thrown into spasmodic contractions. Dr. Ley agrees with Dr. Marshall Hall in the general view taken of this being a disease consequent on reflex action, but asserts that in all severe and fatal cases he has invariably found tumours, or enlarged glands, or deposit of lymph, compressing and irritating the recurrent laryngeal nerves. This affection is readily distinguished from *real* croup, by the absence of febrile action *and* excitement, and by its generally attack-

ing weakly children from eight months' old up to the end of the second year, viz., during the period of deciduous teething.

*Laryngismus stridulus* comes on very suddenly. The child may go to bed apparently well, and awake in the night with crowing inspiration. It frequently follows weaning, and the process of cutting the milk-teeth. The late Dr. Ley made the treatment of this disease peculiarly his study; and in a work published by him has given a very full and general history of it, under the above name—*Laryngismus stridulus*. Dr. Mason Good also described it under that name. Dr. Gooch called it child-crowing. The disease is spasmodic, and not inflammatory, yet not the less dangerous. It is by no means common, many practitioners having never seen, or failed in recognizing it. The attacks are generally sudden, when the child is apparently in health; all at once the head is thrown back, as if con-

vulsed, and in the effort to inspire, the crowing noise is made by the closing, or partial narrowing of the glottis; in a few seconds the spasm gives way, and the child recovering, appears much the same as before the attack; should the spasm last any time, death would ensue from asphyxia. The child may have several attacks in the course of the day, or night, or have only a fleeting seizure. During the attack, the countenance is much distressed, the eyes are full and starting, and suffused—the complexion is livid or purple from the imperfect decarbonization of the blood. The absence of inflammatory action, and of cough, would alone be sufficient to distinguish it from croup; besides, the attacks are paroxysmal—sudden in their invasion, and speedily over.

As regards the cause of this disorder, various opinions have been started; in some cases, the cause has been so slight as scarcely to attract notice; in others, more

marked; while in others none could be assigned. There is a symptom often attending or preceding an attack of this disease deserving attention. Mr. North, Dr. Clark, and others, have noticed it, namely, a peculiar contraction of the flexors of the thumb, fingers, and toes, supposed to indicate a convulsive state. In the cases which the author has seen, the thumbs of both hands have been similarly affected. Professor Hamilton speaks of it "as the most formidable symptom, except convulsions, which occurs during dentition, and peculiar to the period of cutting the deciduous teeth." A decided constitutional tendency is observable in this disease: several children in the same family having been assailed, and all about the same age;—children brought up by hand are more liable to be attacked than sucklings. Any error in diet, acting as an irritant, the sudden retrocession of some affection of



the skin, more particularly the drying up of sores, such as occur behind the ears of infants, will form exciting causes; as also, rigorous climate and season—a damp state of the atmosphere—residence by a river-side, or on clayey or marsh lands, and exposure to cold easterly winds. Most practitioners who have had opportunities of witnessing this disease, are inclined to connect it more or less with teething; indeed, the fact of its often, nay generally, commencing with the milk teeth, and rarely attacking after the third year, would seem to favour this theory. Having previously referred, under the head of croup, to Dr. Ley's views of the pathology of this disease, it only remains to point out the treatment. If the subject of the attack have been only recently weaned, and up to that period enjoyed good health, it would be desirable to restore the breast-milk, by the aid of an efficient wet-nurse. If the gums are swollen

and inflamed, a free incision should be made to relieve the tension from the tooth or teeth: calomel, or James's powder, should be given in doses of two grains each, three times in the twenty-four hours according to the urgency of the symptoms: a lotion of mindererous spirit should be applied to the scalp—a mixture consisting of an ounce and a half of almond emulsion, with two drops of the bi-meconate of morphia, or three drops of diluted hydrocyanic acid is often most serviceable, administered in the dose of a tea-spoonful every five or six hours. Calomel, in larger doses than the above, has been highly vaunted by many eminent men in the cure of this disease. Counter-stimulation over the wind-pipe, by some mild irritant, will prove a valuable auxiliary to the internal remedies. The act of dashing cold water in the face at the time of the paroxsym, or blowing or fanning the face will often cut it short. The prog-



nosis in this disease should be cautiously given, for death has often ensued under the most favourable circumstances, and when least expected by the practitioner or attendants.

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*Pertussis.*

Hooping-cough, has generally been classed among catarrhal affections. It is the convulsive catarrh of Laennec. It generally attacks children, but only once during life, and seems to depend on some specific contagion. Although a disease chiefly incident to childhood, there are instances where adults have caught it from associating with the sick children : others, again, of the same household, have contracted a severe spasmodic cough, similar to chin-cough in all respects save the hoop. A second invasion of the disease is to be considered an exception to the rule. That hooping-cough is engendered by epidemic influence, is

generally admitted, and most practitioners are agreed as to its communicability by contagion. Hooping-cough ordinarily commences as a catarrhal affection, with perhaps rather more general disturbance of the system than usual; after a few days the cough is hard and obstinate, and regular paroxysms occur: at first only convulsive or spasmodic, when all at once, during the cough, the glottis is spasmodically closed, or partially so, and on the effort to inspire, the hoop is elicited. Hooping-cough may be conveniently divided into three stages—first, the catarrhal, which may last from eight to ten days, and be attended with symptoms of an inflammatory character, and bronchial cough: the second stage is one of a mixed character, partaking of the inflammatory as well as of the nervous; and lastly it is uniformly of a nervous spasmodic character: when the disease is at its height, a quick succession of spasmodic

expirations is made, and when the child is almost exhausted by the cough, a violent expiration takes place, attended with the hoop—hence its name; then a discharge of glairy mucus, and often vomiting, which give relief. Hereupon there is a cessation of the cough—the fit is over: but after an uncertain time there is a repetition of the above phenomena. The severity of the attack will depend on the season of the year and the weather, whether severe or mild, as also on the constitution and temperament of the child. Those that are plethoric generally suffer most, and the tendency to inflammation is greater than in such as are delicate. The danger in hooping-cough mainly depends on complication either of the heart or lungs, or from its passing into laryngitis. Convulsions are not uncommon with infants, and cerebral congestion often proves fatal. During the severity of a fit of coughing, it

is no unusual thing for the nose to burst out bleeding, and the small vessels of the conjunctiva to be suffused and ruptured. A moderate bleeding from the nose, in a child of full habit, is rather to be regarded as salutary than otherwise, from its relieving the over-charged vessels of the brain, and so warding off congestion, or inflammation of the lungs, and its investing membrane. Hooping-cough may be complicated with pneumonia, pleurisy, bronchitis, or inflammation of the windpipe. Various opinions have been promulgated as to the seat of the disorder: one class of pathologists refer it to the brain—another to the air-passages: the former maintain it to be a spasmodic disorder, the latter an inflammatory one. Dr. Ley, whose opinion has been quoted on laryngismus stridulus, ascribes the phenomena of the spasmodic cough to the same cause as that producing laryngismus, namely, a certain physical condition of the

glands of the throat, or windpipe; implicating the recurrent laryngeal and pneumogastric nerves, and thus accounts for the laryngeal spasm.

The age at which hooping-cough generally attacks, is from the third month to the sixteenth year; it seldom proves fatal, unless complicated, as before observed, with other diseases: in adults, the paroxysms are more frequent at night. The duration of infection in the case of hooping-cough is most uncertain: a question frequently put by school teachers and guardians of children, to the medical man, whose opinion in all matters relating to infection should be given with much circumspection.

*Anatomical characters.*—As the disease is rarely fatal, unless complicated with inflammation of some important organ, the precise pathological characters cannot be accurately described; they would appear to differ but little from those observed in bronchitis, and

Other affections of the mucous membrane—the membrane of the air passages will be found red, and more or less congested, and when complicated with pneumonia, an engorged hepatized or suppurative state of lung is observed; in the brain there is the usual congested state of its membranes and substance, with fluid in the ventricles.

*The physical signs.*—In the absence of the paroxysm, the respiratory murmur varies: at one time it may be heard loud and sonorous—at another time, and in a different part of the lung, it may be puerile, mucous, or sibilant; on percussion, the chest sounds well.

*Treatment.*—As soon as the malady is unequivocally established, a gentle emetic, given every other morning, is beneficial in producing a relaxed state and general diaphoresis; aided by a mild aperient every other day, occasionally combined with calomel, or grey powder. Among the various



medicines for lessening the violence of the spasms, prussic acid may decidedly rank the foremost; alum has been prescribed either in the form of gargle or of fine powder blown upon the back of the throat : for children, a mixture containing one grain of tartarised antimony, with comp. tinct. of camphor ʒss. to ʒij. (according to the age of the patient). Of Scheele's prussic acid, three or five drops, with four ounces of almond mixture, will prove a good antispasmodic; in doses of a tea-spoonful or dessert-spoonful every three or four hours—embrocations over the chest, and along the upper part of the spine, and over the wind-pipe, may be beneficially employed. The common tar of commerce burnt in the room on a hot shovel, two or three times a day, will prove, in many cases, a valuable auxiliary to the other remedies employed. The old and popular remedy of cochineal and salt of tartar owes its efficacy solely to the

alkaline carbonate of potash. Belladonna has been given in doses varying from the eighth of a grain to the sixteenth part; it requires much caution in its administration but is nevertheless a useful and efficient agent. The principal danger to be guarded against is, the complication of other organs, more particularly of the heart, or lungs. By noting the physical condition of the lungs between the paroxysms of the cough, no difficulty can be experienced in arriving at a correct diagnosis as to whether inflammation exists or not. The absence of fever and the calmness of respiration would be, moreover, conclusive on this point. As regards the local symptoms, the usual appearances denoting congestion, such as stupor, squinting—convulsions, would be so decisive as to be met at once by the active depletory measures proper in these cases. Another complication which is very frequently encountered is gastric mucous in-

flammation, manifested by the furred tongue; peculiar odour of the breath; great tenderness of the abdomen; dark clay-coloured, and highly fætid stools; high-coloured and scanty urine; fever; hot parched skin, and night perspirations.

The diet should be light, consisting of weak broth, chicken, and farinaceous puddings; all heavy solid food should be carefully abstained from.

The duration of hooping-cough is most uncertain—the average being, probably, from six to ten weeks; this will in some measure depend on the season of the year. Hooping-cough coming on in the winter will often last till late in the following spring, whereas if occurring in April or May, the influence of mild genial weather will tend to shorten its course. During the early invasion of the disease, if occurring in the winter, it is desirable that the patient should be confined to one or two rooms.

Perhaps there is no disease which yields so promptly to change of air as this; but before that is resorted to the active inflammatory stage must have passed over.

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*Pneumonia; or, Inflammation of the Lungs.*

This disease may be considered a primary or secondary one, and consists of active inflammation of the minute tubes and cells of the lungs, rapidly rendering these tubes impermeable to air, and giving a solid character to that portion of the lung involved. This is the result in the first instance of sanguineous congestion, and as the disease advances, to the deposit of lymph thrown out by altered structure.

This formidable disease is usually ushered in by violent rigors, dyspnœa, and a dull heavy pain beneath and around the sternum, high fever, flushed face, injected conjunctiva, great heat of surface, pain in the head, full



rapid, but compressible pulse, more or less cough, scanty secretion from the air passages, thirst, great distress, and general irritation of the respiratory system, the number of the respirations being nearly double those of health. There are three well marked and defined stages in pneumonia. In the first or congestive, the parenchyma of the affected lung is engorged with blood or bloody serum. Where an opportunity has offered of examining the lung in this stage, it has been found much heavier than natural, and on being squeezed between the finger and thumb still crepitates. The colour is red throughout. The second stage is that of hepatization; here the lung is more solid and dense than before, and no longer crepitates under the pressure of the finger; when placed in water it sinks to the bottom. The third stage has been termed the suppurative, that of interstitial suppuration, grey hepatization, or purulent infil-

tration. When the lung is cut into, there issues a yellow viscid matter purulent and offensive. A fourth has been noticed by writers on Pneumonia, namely, that of gangrene, but Dr. Williams says that gangrene "unconnected with suppuration is a very rare sequel of pneumonia; it may, however, be caused by inhalation of noxious gases which seem to directly destroy the vitality of the lung." It is satisfactory to know, that the greater portion of one lung may be completely hepatized, and yet after a lapse of time restored to its normal condition.

*The physical signs of the first or early stage of pneumonia.*—On percussion there is more or less dulness over the engorged lobe, and the respiratory murmur is faintly audible in that situation. There is broncophony or increased resonance of the voice, from the fact of the engorged lung being a better conductor of sound than before, and also



crepitation or the "râle crepitant," a sure indication of the morbid condition. This latter rhonchus would seem to depend on a certain resistance given to the air through globules of fluid. Laennec says that while secretion is suppressed, there is the "râle crepitant." As the disease advances and rust-coloured sputa are observed, the "râle crepitant" is rendered humid, and when the secretion becomes viscid and opaque we have the "râle muqueux." It is to be observed, that pneumonia may exist without the least expectoration, even to a state of resolution, of the engorged lung. Stokes affirms "that when secretion is checked there is the 'râle sibilant,' that when secretion is set up you hear the 'râle crepitant,' and when it becomes viscid and opaque then the 'râle muqueux.' " Dr. Latham asserts that this is all perplexing language. He employs simply the terms large and small crepitation; small crepitation depending on

the resistance of the passage of air through small globules of fluid in the air-cells, as in pneumonia and hæmoptysis, and large crepitation depending on the resistance to the passage of air through large globules of viscid fluid, as heard more particularly in the bronchi.

*The physical signs in the second stage.*—When hepatization has taken place the crepitous rhonchus is no longer heard, neither can the respiratory sound be perceived. Percussion elicits a greater degree of dulness than in the first stage. The heart's action seems to be considerably increased, and a sense of pulsation or throbbing, communicated to the solid lung. When the inflammation is seated near the surface of the lung, the root, or the upper lobes, a resonance of the voice is perceptible; bronchial respiration and cough will always be distinguished whenever bronchophony is audible. In the third or sup-

purative stage after purulent infiltration has ensued, mucous rhonchus is discernible owing to the deposit of pus in the air tubes, but there is no expectoration of matter, at least under ordinary circumstances. Andral considers the expectoration of blackish blood characteristic of suppuration. In other respects the physical signs differ but little from those of the second stage. It would appear from the statistical records of medical writers that the right lung is more obnoxious to inflammation than the left. Andral, Chomel, Lombard, and Sir John Forbes, have shown that out of a total of 1131 cases, the right lung was implicated in 562, the left in 333, and both lungs in 236. The disease also seems to assail certain parts of the lung rather than others, and to commence in the lower portion and extend upwards. Thus the lower lobes are more generally affected than the upper. The bronchi are often inflamed together



with the parenchyma. The investing membrane of the lungs, the pleura, is more or less involved in pneumonia, and when this is the case the sufferings of the patient are proportionably increased. Pneumonia is often present in phthisis in one or other of its stages, proving fatal before the tuberculous disease has run its course.

As a secondary disease, pneumonia often supervenes in many of the eruptive fevers, such as small-pox, measles, and scarlatina.

*Treatment of Pneumonia.*—In the early stage, the indication is to subdue the inflammatory and congested condition of the lung by blood-letting from the arm to the extent of twenty ounces. This is the average tolerance. The patient ought to be placed in the upright position in order that the system may feel as speedily as possible the effect of the loss of blood; it is of course desirable that a sensible change should be produced in the character of the

pulse, as also in the relief of pain and dyspnoea. In a general work of this description it would be impossible to lay down a precise rule to regulate the quantity of blood necessary to be abstracted, since much must depend on the constitution, sex, age, and habit of the patient, and the extent and severity of the disease. If after an interval of a few hours, the symptoms should be unrelieved, and the "râle crepitant" persist, blood-letting should be repeated, and if there is much topical pain, cupping or leeches should be resorted to, followed by a large hot poultice of bran or linseed meal. The medicine to be chiefly depended on is tartar emetic, and of which in this disease there would seem to be a greater tolerance than in almost any other. After the first bleeding, six grains of calomel with one of opium should be given to allay the nervous irritability, which often supervenes after copious depletion. The

bowels having been fully evacuated, a grain of tartar emetic should be administered every three or four hours. It is most probable that the first or second dose will be rejected by vomiting, but will afterwards be retained, and then its effect of subduing vascular action is most striking. The dose may be further increased by half a grain every six hours, until a decided impression has been made on the system, and the crepitation vanished. Thus a patient may take with advantage eight or ten grains daily of this nauseating drug without vomiting. Rasori, the great advocate for this treatment considers the tolerance of tartar emetic to be owing to the stimulus which the system receives from inflammation, and that the tolerance would cease if the use were persisted in after all inflammatory action had ceased; it certainly acts not as a depressor merely, but restores also the action of the skin, and keeps under, the energy of the



heart. The sympathetic cough is best relieved by hemlock, henbane, or small doses of prussic acid. When the attack has passed beyond the first stage and the lung is solidified, calomel will prove serviceable; it may be given alternately with the tartarized antimony, and the more speedily the gums are affected, showing that the system is brought under its action, the better the chance of checking the deposit of lymph or removing what has been already deposited. Calomel or blue pill may be exhibited combined with opium, to prevent its running off by the bowels, aided by mercurial inunction, to accelerate the effect of the mercury on the system. At this period great depression is observed, and while the mercurial treatment is being pursued, ammonia and other stimuli are sometimes indicated. The acetate of ammonia with ammonia in excess, will serve to revive the exhausted powers of life. In this stage it is advisable to apply a large

blister over the chest, and to keep it open for a few days by means of savine ointment. The diet should consist of veal broth, and beef-tea occasionally, milk, arrowroot, tapioca, and other kinds of farinaceous food.

*The treatment of the third stage.*—Here there is great prostration, rigors, cold sweats, small rapid and irregular pulse, showing that suppuration is going on. The attention must now be directed to support the strength of the patient, and to cherish the vital powers by every possible means. Stimulants may be given freely, such as wine, ammonia, decoction of senega, also quinine, and the various preparations of bark.

*Gangrene of the lungs*, from whatever cause, must be considered a rare disease, but seldom the sequel of pneumonia, more generally of accident. Two cases of recovery from gangrenous abscess are mentioned by Dr. Stokes, and stated to have been the

result of typhoid pneumonia. Gangrenous abscess of the lung may proceed from violent injury done to the chest, or from the sudden inhalation of poisonous gases, or after recovery from a partial asphyxiated state, where the lung has been damaged and its vitality impaired. The physical signs offer no pathological interest. The symptoms are: sinking of the vital forces, rapid and feeble pulse, intolerable fetor of the breath (so characteristic of the disease), hot and dry skin with hectic fever. The expectorated matter is of a greenish hue: the diagnosis is most unfavourable. The treatment must consist of stimulants in every form, more particularly wine and cordials.

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*Pleuritis.*

Pleurisy is inflammation of the investing membrane of the lungs; it is often associated

with pneumonia, but may exist independently. When present with pneumonia it has been called pleuro-pneumonia. Pleurisy in the acute form is characterised by a sharp pain in the side, lancinating or pricking, and referred to a certain spot or point, a short dry and hard cough, skin hot and dry, pulse hard quick and wiry; the pain is much aggravated by inspiration which is short and hurried, accompanied by rigors and thirst, and high coloured and scanty urine. Recumbency on the affected side is adopted by the patient.

*The anatomical characters.*—On examination the pleura will be found of a red colour, and the subserous cellular tissue highly injected; with serous effusion, varying in quantity, and coagulable lymph having the appearance of an adventitious membrane. As the inflammation is of an adhesive character, bands of adhesion between the pleura costalis and pleura pulmonalis will be observed.



The physical signs of pleurisy are diminished respiratory murmur, slight dulness on percussion; and when effusion has taken place œgophony, and if the effusion is very great, bulging of the affected side. In addition to weakened respiration, a friction sound will be heard, produced by the rubbing of two dry surfaces, similar to what is heard in pericarditis. Another physical sign noticed by Drs. Stokes and Townsend, is the displacement of the heart and liver; the heart, when the left pleura is the seat of disease, may be pushed to the right side behind the sternum, as evidenced by the pulsations of the heart in that position, again, the heart may be pushed over to the left side from the effect of great effusion, and the pulsations will be heard nearer the axilla; in the same way the liver may be displaced and felt far below the margin of the ribs.

*Treatment of acute Pleurisy.*—A full ge-



neral blood-letting from a large orifice, to about twenty-four ounces, is indispensable; there is great tolerance of bleeding in this disease. The good effect will be marked by the respirations becoming deeper, the pulse fuller, and the pain being relieved, while the countenance will have lost much of its anxiety. If the topical pain continue, leeches or cupping glasses should be applied, and afterwards large emollient cataplasms. If the stitch in the side return and the pulse have any degree of hardness, the vein must be again opened and blood abstracted, till the symptoms give way. The blood in pleurisy will always be cupped and buffed, and show a very firm clot.

Mercury is the paramount medicine for the cure of pleurisy, from its tendency in checking the effusion of coagulable lymph; doses of from four to six grains with half a grain of opium should be given every four

or six hours, to get the system as speedily under the influence of the drug as possible, the bowels having been previously cleared out by a brisk purgative; as soon as the inflammation has become subacute a large blister will prove of service as a counter-irritant; if effusion has taken place, which will be obvious from the dyspnœa, dulness on percussion, œgophony, and the other physical signs before mentioned, the attention must be directed to the approved remedies for getting rid of it; this is best done by the combined use of purgatives and diuretics, the mercurial course should still be pursued, and squill, acetate of potash, hydrochlorate of ammonia, and digitalis given freely. In those cases where the sudden effusion of fluid threatens suffocation, time would be lost by the ordinary means employed in draining off the fluid, hence recourse must be had to the operation called paracentesis thoracis, or tapping the

chest and drawing off the fluid contents. The operation is performed at the posterior lateral part of the chest, near the angle of the sixth rib, the trochar should be a flat one, and the skin over the part to be punctured should be drawn up, so as to act the part of a valve in covering the opening so made and preventing the ingress of air.

*Pneumothorax*, from πνεῦμα, air, and θώραξ, the chest,—denotes an accumulation of air in the chest; the cavity of the pleura is distended therewith, and the lung in a state of collapse. Various are the causes giving rise to this affection; thus it may result from an accident, as for instance, that of an instrument entering the chest, or from an abscess in the lung penetrating the portion of pleura covering it, and likewise from the operation of paracentesis thoracis or from the evolution of gas due to the decomposition of liquid within the pleura; but this latter cause is very rare. The physical

signs of pneumothorax are most distinct. Percussion will elicit a greater resonance than the chest ever gives under any other condition; vesicular respiration is absent, and there is metallic tinkling, a clear evidence of air in the chest with fistulous communication with the bronchi. Air may be in the chest with or without liquid; when liquid is present, the air will of course occupy the upper part and the liquid the lower. Here percussion will yield a very dull sound inferiorly, while the resonance above will denote the character of the disease. The opposite lung will serve as a comparative test of the morbid sounds heard on the affected side. When air and water are both present (hydro-pneumothorax) the latter may be ascertained by succussion; in other words, the water may be heard splashing against the side of the chest, when the patient is slightly jogged, or a sudden impetus given to the body; this is



a never failing sign of the joint presence of air and water. The prognosis in this disease is most unfavourable, whether the air in the chest result from accident or pleuritic inflammation, or from abscess in the lung communicating with the pleura, or be in connexion with tuberculous disease. The symptoms are those of great distress and dyspnœa; namely, much pain, short cough from the limited expansion of the chest, with small and irregular pulse.

*Treatment.*—When air in the chest is complicated with disease of the lungs, very little can be urged in favour of any particular mode of treatment. Opium may be given to allay irritation and procure rest, and warm sinapisms applied to the chest. Antimonials and, occasionally, mercurials will be called for. When an external fistulous opening has been the result of accident, and inflammatory symptoms supervene, the antiphlogistic plan must be adopted: it is



seldom that general bleeding, but leeches sometimes may be required. When the patient's strength will admit of it, ease has been temporarily afforded by giving exit to the pent up air through puncturing the chest; the relief to be thus procured, however, is very doubtful.

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*Pulmonary Œdema.*

Œdema of the lungs may be defined an infiltration of serum into the areolar tissue, cells, and minute vessels of the substance of the lungs. This is rather a sequel of other diseases, than an idiopathic malady. Medical writers have sometimes described it as a sort of dropsy of the lungs; others have confounded it with hydrothorax. It is often present with various dropsical affections; it occurs particularly in old persons of broken-down constitutions, connected with disease of long-standing in the lungs

and heart, and in the last stage of protracted fevers. The lung when cut into yields a thin aqueous fluid—its tissue has a grey appearance, is heavier and less crepitant than natural, and does not collapse like healthy lung.

Laennec says, "The disease often takes place just before death, or it may have lasted many months, and in a few of these it seems to have been idiopathic." The symptoms are, principally, laborious respiration, cough, with humid expectoration; there is crepitant rhonchus produced by the presence of fluid in the minute air-cells. The treatment of œdema of the lungs must be modified according to the original disease of which it is the sequel. Blisters are sometimes of service; tartar emetic, digitalis, hydragogue purgatives, will afford relief; in the passive stage, tonics with steel are proper remedies.

*Pulmonary hæmorrhage or hemoptysis* would signify hæmorrhage from the lungs only; the term pulmonary hæmorrhage is equivocal, for it comprises any discharge of blood from the mouth, whether arising from the throat, fauces, nasal passages, trachea, or lungs. The blood in hæmoptysis may be coughed up in considerable quantities, or so slight in amount as only to colour the sputa. A correct diagnosis of the tissue from whence the hæmorrhage arises is of the first importance. The mucous membrane lining the bronchial tubes is most frequently the seat of the flux. Owing to certain conditions of the system, an exhalation of blood takes place through the meshes as it were of this tissue, and would appear to be often preceded by a state of congestion, nature having made an effort to get rid of the mischief: again, the blood may flow from some of the



numerous ramifications of the small vessels and air-cells of the lungs, or from a vessel of considerable size which has given way.

Hæmorrhage from the lungs must ever be considered as a formidable and dangerous symptom. In delicate females, when there has been an interruption to the usual periodical discharge, hæmorrhage from the lungs, as also from the mucous membrane of the stomach is very common; but being vicarious is not attended with any immediate danger, unless it have been so profuse as to reduce the patient's strength to a low ebb. The sudden arrest of discharges of blood from piles, has produced an engorged state of the lungs, and pulmonary apoplexy or active hæmorrhage has followed.

Pulmonary hæmorrhage is often indicative of structural disease, and denotes the presence of tubercles, and that the patient will, sooner or later, be carried off by phthisis. Where the hæmorrhage has been an exuda-

tion from the mucous membrane of the bronchi, no appreciable lesion has been discovered on examination after death. This may be considered the most common form, and a symptom of serious import in the majority of cases. When the hæmorrhage is from this source, it is generally accompanied with fever and much cough. Another cause which might be assigned for the sudden discharge of blood, in the latter stage of phthisis, is that during the softening of tubercles, a vessel has been exposed, and a lesion of its coats effected. Hæmorrhage from the lungs, however, is not necessarily an attendant on phthisis. Hæmorrhage from the lungs is sometimes the result of mechanical violence. Many consumptive persons pass to their graves without having been subject to hæmoptysis.

The flux may be active or passive, secondary or idiopathic; when a vessel has given way it is generally the result of a dis-



organizing process in some part of the neighbouring tissue, or owing to the walls of an aneurism having burst, and perforated the bronchial tubes. Expectoration of blood often follows the softening of tubercle where large cavities are formed; but when the blood is exhaled from the mucous membrane of the minute bronchial tubes, concurrently with tubercles, it is due to congestion produced by the mechanical pressure of these bodies. The sudden suppression of any long-standing discharge,—as, for instance, that of perdurable ulcers or issues, may lead to congestion and subsequent hæmorrhage. The symptoms indicative of hæmorrhage from the lungs, are—dyspnœa and flushed countenance—pain and general uneasiness referred to the upper part of the chest. There is frequently a sensation of tickling about the fauces, producing cough just at the time the blood comes up, mixed with air-bubbles, and mucus from the air-

passages. The colour of the blood will determine whether it is venous or arterial. An attempt has been made to distinguish whether a branch from the pulmonary artery, or a twig from the bronchial artery, has been the source of the hæmorrhage; if from the former, the bleeding is sudden and generally profuse; if from the latter, it is tardy, and small in quantity. In the latter instance the blood gets entangled in the meshes of some of the numerous air-cells, provoking cough, and then is hawked up: it is generally of a dark hue. It is as well to state, that no great practical importance is attached to this point.

The taste of blood will often be perceived in the mouth, before the discharge takes place. The quantity is uncertain; it may amount to a mere streak, or to a mouthful. When hæmorrhage has been copious and sudden, auscultation will elicit a mucous rhonchus with slight crepitation; but if

scanty, the chest will be sonorous; little constitutional disturbance will be manifested, the cough excepted; for however slight the irritation, it will be sure to provoke this symptom. When a sudden gush of blood takes place into the parenchyma of the lung, suffocation may ensue, and the patient die asphyxiated. This is the pulmonary apoplexy of Laennec and others.

When the delicate vascular structure of the lung is considered, the beautiful and fine network, composed of the minutest vessels, its capillary system, the medium of communication between the bronchial and pulmonary arteries and the pulmonary veins, its delicate air-cells—our astonishment is, that a lesion is not more frequently occurring during the violent spasmodic efforts that are made in coughing, more especially when the lungs may have been for some time the seat of active disease.



*Treatment.*—The primary step is to suppress the hæmorrhage, provided that it be not of a critical nature, either to give relief to an over-gorged liver, or to restore some natural function; as, for instance, the periodical discharge in females. Blood-letting ranks first and foremost: accordingly a full and general bleeding from the arm must be practised; the quantity to be abstracted being left to the judgment of the practitioner, derived from the peculiar and varied circumstances connected with the case, and cause of the hæmorrhage. The patient should be placed in a cool ventilated apartment, and fresh air admitted from time to time; pounded ice, contained in bladders, should be laid on the chest, absolute silence and rest strictly enjoined, and whatever is likely to excite the patient most carefully excluded. The recumbent position, with the head and shoulders moderately raised will be the most suitable, and everything in

the shape of diet and drink should be cold. Lemon-water iced, sipped from time to time, will be very grateful to the palate of the invalid. It is scarcely necessary to add, that the antiphlogistic regimen must be sedulously observed. The acetate of lead has long held a high rank as a most useful astringent in controlling pulmonary and other hæmorrhages: three grains, with half a-grain of opium, should be given every four hours, the bowels having been previously relieved by an aperient draught, or an enema. The late Dr. A. T. Thompson was in the habit of conjoining the acetate of lead with acetic acid, in order that the lead might not be converted into a carbonate in its passage through the bowels, for it is the carbonate that produces "colica pictonum." Thus it may be freely administered. Dr. Graves advocates the use of ipecacuanha, in the dose of two grains every quarter of an hour, and this he pre-



fers to the lead salt. When the congested state of the lung has been produced by disease of the heart, more particularly its right side, and the liver and portal system are engorged, the exhibition of mercury will be found an essential part of the treatment. The variety of hæmoptysis, described as passive, is only met with as a sequel of low typhoid fevers, purpura, and scurvy. Here turpentine is a useful medicine.

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### *Emphysema.*

Emphysema is a name given to a peculiar affection of the lungs, by Laennec. He specifies two kinds—the vesicular, or pulmonary, and the interlobular. The disease consists in dilatation of the air-cells of the lungs; these dilated cells vary much in size; in some cases they may be so small as almost to escape observation; in

others as big as a walnut, giving to the lungs, when examined, an irregular globular appearance. By inflating the bronchial vessel, the dilated cells connected therewith will readily yield to the pressure of air, and exhibit plainly the nature of the phenomenon.

*The physical signs of the affection.*—On percussion, there is greater resonance than natural, while the vesicular respiration is scarcely heard, and at some parts of the chest is absent altogether: the external configuration of the chest is altered. Where the dilatation is to any great extent, the chest assumes a vaulted form, and during the act of respiration the natural collapse and distention of the walls of the chest will be wanting.

The interlobular form of the disease differs from the vesicular, inasmuch as its attack is sudden, and a rupture of the air-cells has taken place into the common

areolar tissue: sometimes the pleura has also been ruptured, and the air found its way into the chest, as in pneumothorax. The physical signs of this interlobular variety are said by Laennec to consist of "the dry crepitous rhonchus, with large bubbles; as also, during expiration and inspiration, of a sound or sensation as of one or more bodies rising and falling, and rubbing against the ribs; the chest sounds well when struck, and in this respect differs but little from the healthy condition.

The symptoms of the first variety of emphysema, or the vesicular, are cough and dyspnœa, the absence of fever and constitutional disturbance: as the disease advances, symptoms of a dropsical character arise; the angles become œdematous and pit, and the dyspnœa is urgent. The symptoms of the second variety, or true emphysema, familiarly known to surgeons, present this difference, namely, vesicular

emphysema is a chronic affection of long standing, while interlobular is sudden in its appearance. Owing to some abrupt straining or effort of the muscles, the minute air-cells near the surface of the lungs give way, and air is effused into the common areolar tissue: when the effusion takes place near the root of the lungs, it passes to the mediastinum, thence to the neck, and gradually over nearly the whole of the cellular tissue of the body. The cause of the first variety may, in some instances, be traced back to a very early period in the life of the patient—some violent catarrhal affection, with a morbid condition of the mucous membrane, at a time when the smaller ramifications of the bronchial vessels have been obstructed, would cause the air-cells to be dilated beyond their power of elasticity, and thus a permanent enlargement is left. Children with whooping-cough, and other spasmodic affections of the larynx, are very prone to strain and



permanently enlarge the delicate net-work or meshes of the air-cells. The causes of the true emphysema will be found in the violent efforts occasioned either by running, rowing, jumping, lifting heavy weights, by efforts in child-birth, and by vomiting.

*Treatment.*—The object is to remove, as far as practicable, everything that may be aggravating the disease. The primary point will be to relieve the embarrassment of breathing, the cough, or any inflammatory condition of the bronchial vessels or mucous membrane. This will be best attained by those remedial and other means which have been previously laid down. Removal to a mild climate, the avoidance of anything likely to act as an excitant to the pulmonary organs; further, expectorants, blisters, and counter-irritants, will be found beneficial in alleviating emphysema.



*Melanosis of the Lung.*

*Melanosis of the lung*, sometimes called black tubercle, occurs under two types—the true and the spurious. Laennec reckons four different forms. Dr. Carswell, in his illustrations of the elementary forms of disease, wherein he has treated the subject with great ability, recognizes only two kinds, but divides these into four varieties, or species. His definition of the true, is as follows: “True melanosis consists in the formation of a morbid product of secretion of a deep brown or black colour, of various degrees of intensity, unorganized, the form and consistence of which present considerable variety, solely in consequence of the influence of external agents.” The seat of the true kind, according to Dr. Carswell, is usually the serous tissue; where this tissue constitutes the cellular elements of organs, every organ of the body has been found laden with the black pigment from which

their colour is derived; it is usually deposited in the cells of the serous tissue, and in time is aggregated into tumours, which are encysted, and vary in size from that of a bean to a walnut. Dr. Carswell, who is a great authority touching the pathology of melanosis, says—"Only two changes are observed to take place in the melanotic matter after its deposition. The first consists in the inspissation or solidification—the second, in the softening or liquefaction of the melanotic matter. The material of which melanosis is composed, exists primarily in a fluid form, and every increase of consistence which it afterwards acquires, is owing chiefly either to its combination with the molecular structure, or the dense unyielding nature of the tissue or organs in which it is deposited. It follows as a consequence, that the process of softening cannot take place until that of solidification has been at least carried to a certain extent: perhaps

it never does take place until it has been carried to its maximum, for the softening of the melanotic deposit is observed only when it has acquired the form of a tumour, or occupies an irregular portion of an organ; under these circumstances, the softening of the hardened melanotic mass is effected in the two following ways: first, by destruction of tissues included within and around it; second, by the effusion of serosity caused by its stimulating power as a foreign body; the liver and lungs furnish the best examples of softening of melanotic tumours from destruction of tissue in which they are formed." (*Cyc. of Pract. Med.*) Spurious melanosis is a deposit of black matter in the pulmonary tissue, produced by fuliginous particles floating in the atmosphere in the neighbourhood of large furnaces and coal fires. Colliers are often the subjects of spurious melanosis from the quantity of carbonaceous matter drawn into the lungs during

their avocations. The black matter is confined to the cellular tissue of the lungs. The black tubercle in true melanosis is rarely seen there: the spurious is only found in those localities where persons are living in an atmosphere loaded with black carbonaceous matter, whereas the true kind may occur in any locality, even the most pure and salubrious.

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### *Influenza.*

*Influenza.*—This peculiar and severe form of catarrhal affection, has long been known, and formed the subject of many able and voluminous essays, both by foreign and English writers in the present and last century: indeed, it has been noticed from the time of Hippocrates down to the present period. Various names have been given to it by different nations. The English have adopted the Italian name—*Influenza*. The

French have termed it "La Grippe," "Rhume Epidémique." It has been much the fashion of late years to call every severe cold, influenza; but the influenza is not so common a disease, for it rarely visits this and other countries oftener than once in seven or eight years. It is a malady *sui generis*; though attended with catarrhal symptoms in the most severe form, its appearance is sudden and general, apparently invading every person in a place at the same time. The symptoms that usually usher in an attack, are most marked and severe: rigors, headache, pains in the limbs, and muscles of the back and spine; as also in those of the upper part of the trunk generally; uneasiness about the sternum—a sense of oppression about the præcordia—distressed breathing; sickness is often an attendant—in fact, all the premonitory symptoms of fever are present. The cheeks are flushed, the skin is alternately hot



and cold; the eyes are suffused, there is short harassing cough, and great prostration of mind and body; a general state of enervation quickly follows. The disease is epidemic, and can only be accounted for by reference to those laws that govern epidemics generally, and of which so little is at present known of a satisfactory character; how it comes, why, and where from, and under what influence, must, at all events, for the present, be left undetermined. We only know it arrives at all seasons of the year, whether these be hot or cold, damp or temperate. During the years 1732, 1762, 1775, and 1782, the epidemic visited this country, as well as the continent, most severely and fatally. The duration of the epidemic was from four to six weeks: the most fatal cases were among the very young and very old, and many that recovered from the attack, were afterwards carried off by phthisis pulmonalis. Hence it would ap-

pear to have stirred up in those predisposed, the germs of that fatal disease which heretofore had been lying dormant in the system. Animals are liable to be assailed by influenza—more particularly, horses, cows, dogs, and sheep. That influenza is epidemic, dependent on atmospheric influence, is so generally known and admitted that it would be needless and useless to multiply instances in proof. Dr. Watson, in the 2nd vol. of his “Practice of Physic,” has related the sudden manner in which large bodies of men have been attacked: and states that the influenza broke out suddenly all over London, and the kingdom, on the 2nd and 3rd of April, 1838, and that the Stag frigate, coming up the channel on the same day, arrived at two o'clock off Bury Head, on the Devonshire coast, all on board being at that time well. In half-an-hour afterwards, the breeze being easterly, blowing off the land, 40 men were

down with the influenza; by six o'clock, the numbers were increased to 60; and by two o'clock the next day, to 160—clearly demonstrating the atmospheric relation, and evidencing also that the disease is, and may be, conveyed without personal contagion. We have proof also, that influenza, like cholera, travels against winds and monsoons, but is generally observed to take a westerly course. It may be fairly argued that the epidemic arises from atmospheric miasma, as aforesaid, but it also may be propagated by personal contagion, in a limited extent.

The treatment of influenza may be very briefly stated; on the first invasion, the patient should be confined to his bed, or chamber, and have a dose of calomel, with colocynth, and James's powder, followed by a cathartic draught; a mixture of the acetate of ammonia, containing nitre, squill, and antimony, should be taken every four

or six hours; a large mustard poultice placed over the chest will relieve the oppressed breathing, and promote secretion from the mucous membrane. Sometimes this treatment may be preceded by an emetic, which is useful in several ways: it empties the stomach, emulges the biliary vessels, relieves the chest, and determines to the skin. The surface of the body should be kept warm, and diaphoresis encouraged by partaking frequently and plentifully of diluent drinks. Blood-letting should be most carefully shunned, on account of the great debility and prostration always present. There may be necessity for capillary bleeding, however, if the disease be complicated with inflammatory and local congestion; the diet should be spare, light broths, and farinaceous puddings, but afterwards a more liberal aliment may be allowed.

The attack itself lasts a few days only, but the resulting weakness and prostration will be long felt. The after-treatment will include the use of light tonics, with wine. Change of air from an inland locality to the sea-side, and *vice versa*, will greatly tend to restore the general health. A careful practitioner must ever be on the watch, especially in the severe forms of this disease, for inflammatory complications, particularly pneumonia, and acute bronchitis.

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*Asthma.*

*Asthma.*—Spasmodic asthma may be defined—a difficulty of breathing, temporary or otherwise, occurring in paroxysms, accompanied by wheezing, constriction over the chest, with or without expectoration. It is seldom that the disease is idiopathic, generally the result of some morbid affection



of the lungs and derangement of the primæ viæ. The bronchial tubes are the vessels chiefly affected.

An attack of asthma usually occurs at night—the recumbent position seeming to favour its invasion. The premonitory symptoms are—languor, loss of appetite, flatulence, headache, heaviness over the eyes, uneasiness about the præcordia, drowsiness, and even stupor.

At the period of seizure, the patient awakes up suddenly, unable to get his breath, with a sense of suffocation and great tightness, uneasiness, and weight over the chest; he tries to expand the thorax by placing himself in the most eligible position—the shoulders thrown back, the body sometimes bent forwards: the wheezing is loud, and heard in any part of the room; the countenance distressed, and often livid or purple from the imperfect oxygenation of the blood, the eyes are prominent and start-

ing, while a cold clammy moisture bedews the forehead; the extremities are frequently cold, there is an urgent desire for fresh air, the patient makes signs for the doors and windows to be opened, and appears literally gasping for breath; he attempts to cough—but at this stage brings up only a little frothy mucus. The pulse is quick, weak, and irregular, occasionally intermitting: these symptoms will last for some hours; towards morning expectoration returns, and relief will generally be obtained by an abatement or cessation of the symptoms. The breathing will now be free and unembarrassed, but the invalid feels weak and exhausted. These paroxysms will recur at the same time the following night, though not always with the same severity. In aged people, or when the affection is dependent on disease of the mucous membrane, the lungs, or the heart, the symptoms of dyspnœa are always more or less constant. This is

too often the case when a lesion of some of the air-cells exists or are preternaturally dilated and emphysema is the consequence. The patient is then said to be permanently asthmatic. That asthma is a spasmodic affection is manifest from the suffocative tightness of the chest. Reisseissen, by his anatomical investigations has demonstrated a complete set of muscular fibres, lining the bronchial ramifications, and there can be no doubt that the fit usually depends on spasmodic contraction of these fibres, impeding the transmission of air to the lungs. Dr. Williams, by a series of experiments, has satisfactorily proved the contractility of the muscular fibres under electrical and mechanical stimuli, and their relaxation when the stimulus is withdrawn. Asthma would appear to be one of those spasmodic affections referable to the excito-motory system, the par vagum according to Dr. M. Hall, being the afferent nerve of communi-

cation. The exciting causes of spasmodic asthma may be said to consist of some internal local irritation within the chest, often influenced by other predisposing causes, such as a heavy meal, causing flatulence of the bowels, pressing upwards the diaphragm—a fit of dyspepsia—sudden emotions of the mind—hereditary predisposition—cold, or the hasty recession of some eruptive disorder.

*The physical signs of spasmodic asthma* are imperfect respiratory murmur, and dulness on percussion. Laennec says, that if the person, during an attack of asthma, hold his breath for a short time, and then breathe quietly, the spasm will give way, and the respiratory murmur will be heard throughout the extent of the lungs; but ere long the spasm returns.

*Diagnosis.*—The suddenness of the attack, and its equally sudden cessation, together with the absence of fever, serve to

distinguish asthma from inflammatory affections. The prognosis is generally favourable, provided the ailment be not complicated with disease of the heart, or other morbid conditions of the lungs; this malady indeed must be considered rather distressing than dangerous.

*The treatment.*—An emetic in the first instance will often prove a valuable and safe auxiliary. The bowels should be relieved by an active saline purgative, preceded by a dose of calomel or blue-pill, or a stimulating injection to unload the lower gut. The antispasmodics most in repute for the relief of asthma, are :—æther, lobelia inflata, stramonium, tobacco, camphor, musk, asafœtida, hyoseyamus, hydrocyanic acid, coffee, &c. The object being to give speedy alleviation, a flannel rung out of hot water, or poppy decoction, may be applied over the chest, and a dose of æther and paregoric, in camphor mixture, exhibited with a few



drops of comp tinct. of colchicum, and repeated at intervals, according to the severity of the attack. Signal relief has often followed the inhalation of the steam-medicated water: thus inhalation of the vapour of a few drops of creosote with boiling water, for a few minutes, has often been followed by speedy relief. It has been asserted by various authors that the inhalation of the fumes of burnt nitre paper has been of signal use and relief to the sufferer. A rather thick bibulous paper should be soaked in a saturated solution of saltpetre, it should be kept in a vessel impervious to air. Chloroform should never be inhaled in asthma, the danger would be imminent. So soon as the paroxysms have abated, the attention should be directed to the state of the general health as connected with the cause of the attack. If a damp locality has been the predisposing cause, removal to a dry and elevated ground should be recom-

mended. Locality has much to do in the treatment of asthmatic patients, but no general rule can be laid down, no two cases being precisely similar. It is a fact well known to most physicians who have given their attention to this disease, that many patients are almost cured while living in the dense murky atmosphere of large towns and cities, and their sufferings much aggravated when returning to the country, and others whose attacks of asthma arise from other morbid influences are much benefitted by an inland or sea-shore residence. A good stimulating embrocation, or blister over the chest, has proved useful in warding off a second attack. Blood-letting in spasmodic asthma must only be had recourse to in the event of impending danger. Dry cupping is occasionally of service.

The other variety of asthma, and from its only occurring in the summer, called *Catarrhus Æstivus*, and popularly, "hay-

asthma," is a peculiar affection of the mucous membrane, implicating the eyes, the nose, and the bronchial membrane, producing a considerable secretion, with tightness across the chest, and dyspnœa. This affection is supposed to take its origin from the exhalations of a certain grass which comes into flower about the end of May and June. It is by no means common, but is better known to medical practitioners in the country than to those who practise in crowded cities, and in large manufacturing towns: during the season of hay-making many persons suffer much from this affection and escape only by prompt removal to the sea-side, or other places where hay-making is not carried on. Should they return too soon within the noxious sphere, they will again be attacked. They ought, therefore, to remain absent until the emanations from this particular grass are entirely dissipated. Dr Watson, in his second vol. of "Practice

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of Medicine," mentions many cases illustrative of the primary and secondary attack. Dr. Elliotson, likewise, in his Lectures, published in the "Medical Gazette," has given a good deal of information concerning this ailment.

*The treatment* chiefly consists in the removal to a locality exempt from the above morbid influence. The sea-side is generally preferred under the circumstances. The medical treatment comprehends antispasmodics and mild tonics. Bark and iron have proved useful in rendering those subject to the malady less liable to future attacks. The chlorides of lime and soda, placed in the different apartments, will tend to destroy the miasma producing this disease.

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Whilst these sheets were passing through the press, the following remarks appeared

in a number of the "Lancet," June 8th, 1850, the authority being respectable I have appended them to this article.

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*On the use of Nux-Vomica as a remedy in  
Hay-Fever.*

The efficacy of nux-vomica as a remedy for hay-fever is not generally known.

The symptoms which are removed by its administration are, distressing paroxysms of sneezing prolonged until a state of depression ensues, and preceded by excessive irritation of the Schneiderian membrane, the conjunctivæ and the face; the latter being heated at the time of the paroxysm, and during the intervals, as if a hot plate of iron was nearly in contact with it.

I believe that the farina of grass has no more influence in causing the disease than that of any other flowers; in hay-fields and hay-lofts there is necessarily more dust than



elsewhere—but the dust from beaten carpets, from the roads, and from other sources, produces the same distressing symptoms. I am led to think that in the middle of summer, from the end of May to the end of July, at which time hay-fever generally ceases, a quantity of fine dust floats in the atmosphere, finer than any which is in the air at other seasons, increased probably by the farina of the mass of flowers at that period in bloom, but that during later and earlier months, the more frequent rains, and the dews at night, prevent these particles from leaving the ground; and I have been induced to suppose that this reasoning is correct, by finding that, however distressing the symptoms have been during the day, they are all entirely removed upon the occurrence of a shower of rain; the face becomes cool; the irritation of the nostrils and of the eyes ceases, and does

\* not return until the heated atmosphere has again evaporated the fallen rain.

The relief afforded by a residence near the sea appears to be owing to the absence of fine particles of matter near so large a surface of water.

I am indebted to my friend Mr Hammer-ton, of St. George's Hospital, for suggesting to me the nux-vomica as a remedy in this complaint, which has frequently caused me, personally, much annoyance; it was administered by a friend of his to large numbers of the country people in his neighbourhood, who flocked to him annually for relief, having experienced so much benefit from it.

Having taken it for three years with decided effect, and having for nearly that time prescribed it for others, with equal success, I feel bound to publish it through your columns, if you will do me the favour to insert

this letter, the result of its use in a harassing disorder, with which many persons are at this time threatened.

The preparation recommended, and which I have always prescribed, is the tincture of *nux-vomica* of the "Dublin Pharmacopœia." Ten drops of this should be given for a dose in water, and increased gradually to twenty drops, three times a day: the action of it should at first be watched. It is an agreeable light bitter; increases the appetite; and influences the Schneiderian membrane, no doubt through the medium of the nerves.

I have accompanied the administration of the tincture with the application of an ointment (as high up in the nostrils as possible) composed of one drachm and a half of Goullard's extract, two ounces of spermaceti cerate, and a few drops of oil of roses or of bergamot. (T. G. Gream, Esq., M.D.)

*Phthisis Pulmonalis.*

*Phthisis pulmonalis*, or pulmonary consumption, one of the most common and fatal diseases to which "flesh is heir to," awakens a melancholy interest in the fact, that its victims are more especially the young and beautiful of our race, and that its annual ravages extend to not less than a fourth part of the entire population of Europe. In Great Britain alone the yearly roll of victims numbers 60,000. This circumstance has caused the name of "English disease," to be applied to it in several parts of the continent; but, now that better statistical information is forthcoming, it is very doubtful whether France, Germany, Holland, and even Italy, are not equally deserving of a share in this unenviable notoriety. Be this as it may, however, it is certain that the average duration of life is greater in England, than in any part of the European continent.

Phthisis pulmonalis is satisfactorily proved to be a form of scrofulous disease, and, in order to form any correct idea respecting it, this fact must be fully apprehended. There are the same constitutional peculiarities in each case. There is the same gradual deposition of a diseased deposit, the same progressive softening of that deposit, the same form of accompanying abscess, and, when the disease is sufficiently extensive, the same mode of death by hectic and exhaustion. Pulmonary consumption, moreover, often interblends with the other kinds of scrofulous disease, and nothing is more common than for the disorder to begin as King's evil, or some of the allied affections, and to end as pulmonary consumption. Indeed there are few phthisical patients who do not present some evident mark of scrofula, either past or present, particularly enlarged or ulcerated glands, or the cicatrices resulting from such mischief.



The causes why the disease should show itself at one time as pulmonary consumption, and at another time as King's evil, are not very clearly determined, but there are some facts, which are less generally known than they ought to be, which seem to throw some light on the subject. Formerly, there is reason to believe, King's evil and the allied diseases, were much more common than they are now, and pulmonary consumption much less common. At all events consumption was much less common in Holland, Scotland, and Russia, sixty years ago than it is now. There is also reason to believe that the cause of this was owing, to some extent at least, to certain differences in the dress of the people, by which the skin was kept comfortably warm. With regard to Holland, there are some very interesting particulars in a work on pulmonary consumption, which was written upwards of fifty years ago, by Dr. Beddoes. These particulars are on the authority of Dr.

Cogan, a physician who practised many years in both London and Rotterdam, and who was therefore practically acquainted with the subject. According to this writer, consumption was very uncommon in Holland before the introduction of the French style of dress. Before then a cough was scarcely ever heard in a church. He thinks the change of dress and the consequent exposure of the skin to cold, by which, to use a popular expression, the blood was driven inwardly to the lungs, was the main cause of the introduction of consumption; and he describes the former costume of the Dutch, in order to enforce this idea. "The Dutch," says he, "envelop themselves in clothing of which a stranger can form no conception. Most of them wear two shirts, and a flannel waistcoat with sleeves, which they call a *corstrock*, between them. The *corstrock*, caleçons, or drawers, with woollen stockings, are the constant companions of both sexes, night and day; to these

are superadded a *gezonthied*, or small waistcoat without sleeves, it has its name from its being supposed conducive to health. Some surround their bodies with wrappers of thin woollen cloth, several yards long; to these succeed the coat and waistcoat, as with us, the latter always with sleeves; and when they go into the cold air, they had either a pelisse, or *schautz looper*, which is made of thick cloth lined with woollen. Their females are proportionally warmly clad; and as to their infants, they are absolutely made about the size and shape of a moderate bolster, before they dress them in garments which are to meet the eye. The inadequate protection of the skin by the present style of dress, as compared with this, is very obvious." Dr. Cogan is also disposed to think that the change from open, well ventilated rooms, to close apartments, fitted up after the French style, which took place about the same time, and the consequent breathing of hot foul air,

might have something to do in producing the pulmonary congestion, which eventuated in phthisis, but he attaches less importance to this cause, than to the laying aside of the warm vestments, and the disuse of the *chauffrets* by which the feet were kept constantly warm, when the apartments were open and airy. This opinion is supported by what took place in Scotland and Russia, coterminously with the increase of consumption in these countries. With regard to Scotland, it may be stated on the authority of Dr. Beddoes, who investigated the matter very closely, that the people became more subject to consumption when they discarded their warm homespun woollen articles of clothing for the flimsy and gaudy wares of the cotton-loom. With regard to Russia, the opinion of Sir Alexander Crichton, who was a most competent witness, is very positive. Speaking on the influence which the climate of Russia exerts in the generation of pulmo-

nary consumption, he says, "The lungs suffer rarely, except in public schools, and among those who adopt the European dress and fashions ;" and, at another place, he adds, "The nobility and the higher classes in Russia, especially those who inhabit the two capitals and the larger cities, who have adopted the European dress and usages, and are under the tyranny of European fashion as to late hours, and other irregularities, to whom may be added the military of Russia, are becoming every day, more and more subject to consumption." Many facts of the same kind might be added, but these will suffice to afford one hint, at least, why the lungs should be the favourite seat of the disease, for it is an established fact in physiology, that if the action of the skin be deficient, as it will be when chilled by exposure to cold, that the lungs must take on a compensatory action, by which they would be more congested with blood than



they ought to be, and proportionally prone to diseased changes.

Be, however, the determining causes of pulmonary consumption what they may, the exciting causes of the parent disease, scrofula, are well known. These are, more particularly, want of good air, want of good food, and want of good clothing. These wants are of course aided by any kind of constitutional debility, whether this be transmitted or acquired. The causes are, in fact, all those which induce debility, whether these are in the form of want, or excess, or of both combined. It is difficult to say whether any one of these is more important than another, but if any one could be indicated particularly, it would seem to be want of sufficient animal food. The reason for this would be, the comparative or absolute immunity from consumption of butchers, and other people who habitually consume large quantities of animal food. This im-

munity, with regard to butchers, was established by Dr. Beddoes, in a very extensive investigation, the particulars of which are contained in the work already referred to. It has been established also by other persons with regard to the fishwives of Edinburgh, and the keelmen of Newcastle-on-Tyne, both of whom consume very large quantities of butcher's meat. The florid appearance of these people, particularly of butchers, which is characteristic of them and of their diet, is quite corroborative of the immunity referred to, for this appearance is the very opposite of the pale or sallow complexion of the subject of consumption.

The consideration of the nature of the causes is sufficient to place pulmonary consumption in its proper place in the category of diseases, namely, among those diseases which depend on a condition of blood which is the opposite of richness, and on a

state of system which is the opposite of inflammatory. The notion, however, is still entertained by some that the disease is akin to inflammation. Even Andral is of this opinion; but his voice is almost a solitary one. Slight attacks of pulmonary inflammation undoubtedly occur frequently in the course of phthisis, but these are generally both limited in extent and slight in degree. Often they are manifestly salutary, as when they limit the spread of the phthisical disease in the lung, or when they prevent the extension of ulceration into the pleural cavity surrounding the lung. And in no instances, or in very few instances, do they accelerate the course of the disease. This fact has been clearly determined by M. Grisolle, in his valuable investigations on pneumonia, and it is fully confirmed and inculcated, by no less a person than M. Louis. Sometimes, undoubtedly, serious consequences may ensue, and phthisical

patients may die of inflammation of the lungs, but these cases are quite exceptional, when compared with the ordinary modes of danger and death. Indeed, it is an open question, whether the phthisical patients who have thus sunk would not have been attacked with pneumonia, if they had not been phthisical. It is a point in dispute whether the pneumonia was accidental or incidental. The non-inflammatory character of consumption is seen most conclusively, however, in the ordinary way in which the disease commences. This, as is very well known, is not by an attack of inflammation or by any other mode which is likely to attract attention, but it is by a silent and stealthy inroad, and when the victim is aware of the danger, his enemy has secured a dangerous if not mortal hold upon him.

Very much has been written upon the nature of the diseased product, which forms

the essence of pulmonary consumption, and to which the name of *tubercle* is given. Laennec considered it as a kind of parasitical growth, endued with a peculiar life and structure, and tending, by the inherent laws of that life, to go through a definite series of changes and transformations. Andral considered it as the product of a specific kind of chronic inflammation. Carswell regarded it as a modified kind of secretion from the pulmonary or other mucous membrane. The opinions of others are very various. That opinion, however, which seems to be most tenable, and which is gradually supplanting all the others, is that of Virchow—and this is that the tuberculous change is not a specific exudation, but a specific transformation—*tuberculous metamorphosis*—of the natural tissues or secretions, or of inflammatory or other exudations. This metamorphosis is akin to fatty degeneration, or to atheromatous, calcareous, or other de-



generation, but not to inflammation, or to any other living process like the growth of cancer. It affects all tissues, or secretions, or exudations, indiscriminately. It consists in the very opposite of nutrition, and it may be said to be a slow kind of mortification. The microscopical appearances are very varied, as may be gathered from the manner of its formation. The cells, when there are any cells, may be relics of epithelial cells, or of some other natural product; or they may be related to, or identical with, exudation cells, and pus-globules; or they may have close affinities to the cells occurring in cancerous or sarcomatous growths, or in typhoid infiltrations. Arising, in this way from a promiscuous metamorphosis of any constituent of the body, tubercle has no constant and characteristic elements; but those which may be considered as most constant and characteristic are the *tuberculous corpuscles* into which the several cells (already mentioned) break up.

Tubercles are found sometimes singly, but more generally in groups; they are fewer in number in the posterior part of the lung, and more numerous and clustered in the upper part, and near the root. The left lung is more frequently the seat of tubercle than the right. Louis states that in thirty-eight cases examined after death, where the lung was totally disorganized, twenty-eight were on the left side and only ten on the right. Tubercles may, and often do remain in a crude state for an indefinite period, until at length, owing to some exciting cause, they determine irritation in the surrounding tissue, and set up what is commonly called scrofulous inflammation. Then purulent matter is expectorated. Where a large number of tubercles exists, a general softening of the mass ensues, the softened material is expectorated, and cavities are formed, to which the name of *vomicæ* is given by pathologists.

Phthisis pulmonalis, in a practical point of view, may be divided into three stages: the first includes the period when the tubercles are hard, and when but little inconvenience is occasioned by them beyond a cough, which is short and hacking, as if something was lodged in the upper part of the throat; the pain is slight and rheumatic in its characters, and the localities affected are the upper portion of the chest or side, the top of the shoulder, and neighbourhood of the scapulæ. In this stage there is scarcely any constitutional disturbance, but that depends a good deal on the kind of subject. Where the temperament is lymphatic, the form slight and delicate, the skin fair and transparent, with blue eyes and light hair, a feverish state of the body accompanies this early stage of the disease; the cheeks are flushed, and the eyes have a preternatural brilliancy—lassitude is much complained of—the sleep is disturbed, the

patient arises in the morning weary and unrefreshed, and a chilliness is experienced during the early part of the day. To this succeeds a feverish glow, followed by a moist state of the skin.

In the second stage, the symptoms are more plainly marked than before—the cough is louder, and prolonged, and deeper; the pains are more severe; a constant and gradual wasting of the body takes place; the weakness is increased; night perspirations, indicative of hectic fever, are copious; the patient after a restless night gets a little sleep and relief towards the morning. In this stage hæmoptysis is occasionally present, suppuration is established, and vomicæ in the upper part of the lungs may be detected by auscultation; the expectoration is profuse, of a muco-purulent character, and occasionally streaked with blood; great dyspnœa and breathlessness are complained of, particularly on ascending stairs; and

diarrhœa often supervenes, and speedily reduces the strength.

The third and last stage runs its career most rapidly ; the cough and dyspnœa are very urgent—the expectoration is excessive, the weakness and prostration are most distressing ; little rest is obtained, and the poor patient is unable to lie down from the dyspnœa and sense of impending suffocation.

Colliquative diarrhœa and profuse sweats, superadded to the incessant expectoration, soon hurry the sufferer “ to the undiscovered country from whose bourne no traveller returns.”

The physical signs in the early stage of phthisis, though rather obscure in some respects, may, nevertheless, with adequate care and attention, be satisfactorily made out. This would apply to those cases in which the tubercles are few, and widely scattered over the lung generally. When congregated



together in masses at the apex of the lung they are easily detected. Percussion on the clavicle, or beneath it, will emit a dull sound, and an imperfect respiratory murmur will be observed on auscultation, while in the other parts of the lungs the murmur will be generally heard. Towards the clear elucidation of the early stage of phthisis, the practitioner will be aided in forming an opinion by studying the general appearance of the patient together with the symptoms that may present themselves: as cough, any peculiarity of constitution, the fact of hereditary tendency or predisposition; the calling in life, the age, sex, and temperament; whether the catamenia have ceased, and whether there is any previous disease of the respiratory organs, weighing well the influence these circumstances may exert on the development of phthisis. Again, the various modifications observed in the inspiratory murmur will be an increase of intensity: the expiratory mur-

mur will show also increase of intensity and duration; so that the quality of these murmurs may be regarded as indicative of the presence of tubercle. In Schill's Semeiology, we read that "in the normal state the sound of inspiration exceeds that of expiration, as well in duration as in distinctness and audibility: a deviation from these relations is a sign of disease." It is not often that the medical practitioner is consulted in the very early stage of phthisis, for the symptoms are of so trivial a character, and the loss of health and inconvenience so slight, as not to attract much attention. Laennec says, that he never could detect tubercles in the crude state, however numerous they might be. In this stage, where the tubercles occupy the apices of the lungs, auscultation will discover modifications of intensity and duration in the expiratory murmur. The indurations may offer a partial obstruction to the passage of

air, and some degree of wheezing or roughness may be heard occasionally, but these sounds may be lost when a chronic affection of the bronchial vessels exists.

The physical signs in the second stage, that is, when the tubercles are softening, are unequivocal: the cough is softer than before; gurgling is heard, owing to the admission of air with the sputa; as the disease advances, pectoriloquy is audible, in addition to the submucous rhonchus, and the respiration becomes bronchial; so soon as a cavity is formed, resonance is again perceptible where before there was dulness on percussion; there are moreover cavernous respiration and cough.

Of the physical signs in the third stage—besides many of the signs in the second, the sputa are more uniformly purulent, sometimes streaked with blood. There are distinct pectoriloquy and cavernous respiration. A peculiar sound, called by Laennec

and others, metallic tinkling, is often heard when there is a morbid excavation in the lung; the sound bears a resemblance to that of a bell when struck, or to the vibration of a musical chord.

It has been remarked above, at page 196, that the left lung is more obnoxious to tubercle than the right. M. Louis states that in thirty-eight cases where he found one upper lobe disorganized, twenty-eight were on the left side, and of the seven cases in which the tubercles were confined to one lung, five were on the left side. According to the experience both of Dr. Stark and of Dr. C. Smith, the left lung is more frequently affected than the right. Laennec alone entertained a different opinion.

*Treatment of phthisis.*—The adage "Prevention is better than cure," would especially apply to consumption. The main principles of treatment are: to ward off the disease in the instance of patients where an



ascertained predisposition exists ; to arrest its course, while in the incipient stage ; and to palliate symptoms and postpone the fatal termination in hopeless cases where the disease has already made progress. In the first instance, where consumption is threatened, where there is delicacy of constitution conjoined with a marked scrofulous diathesis, and where near relatives have been victims to the malady, every means should be taken to invigorate the system. These are—removal to a warm climate for the winter months, warm clothing, nutritious diet, sponging the body daily, more particularly the chest, back and front, with salt and water or vinegar and water,—and above all, daily exercise in the open air. An occasional visit to the sea-side, and excursions on the sea, provided the patient does not suffer from sea-sickness, will tend much to support and strengthen the constitution. Cheerful society should be frequented, and



every topic or circumstance having a tendency to depress the spirits and cause pain sedulously avoided. A remedial agent, and one of fashionable repute is, cod-liver oil—this may be administered for two, three, or four weeks at a time. From the report of the officers of the Consumptive Hospital, it would appear to be a very valuable medicine. It seems to act principally by improving the assimilative functions. Persons after taking it for some time gain flesh and plumpness. It is not generally known that cream answers every purpose for which cod-liver oil is prescribed and is taken much more readily by children, and others whose stomachs rebel against the oil, and when it can be had the Devonshire clotted cream is the best for the purpose. When the disease has fairly developed itself, and the presence of tubercles in the lungs is unequivocally marked, and when the cough is hard and frequent, indicative of much local vascular

irritation, small bleedings have been recommended; but the employment of leeches, or the cupping-glass is preferable to general bleeding, however small the quantity may be. In these local irritations when the abstraction of blood is hardly admissible, aconite in small doses will subdue vascular action and calm down inflammatory irritation. Counter-irritation over the affected part should be had recourse to repeatedly; a small blister, or issue, kept open for some time, where local pain and a congested state of lung is present, will often prove decidedly serviceable. Emetics given frequently, say every other day, appear to have been attended with beneficial results. Sir James Clark has revived this practice (originally advocated by Morton), in the early stage of phthisis. It is supposed that emetics act beneficially by removing, at intervals, the deposit of tubercle that may have taken place in the pulmonary vesicles or capillary

bronchi. They cannot, of course, dislodge what is deposited in the intervesicular cellular texture. When the disease has advanced to that stage in which disorganization has commenced, and the sputa are of a muco-purulent character, when the patient, enfeebled by nocturnal sweats, is daily losing flesh, harassed with irritative cough, and disturbed nights, the *liquor opii sedativus* will prove useful in procuring sleep, and allaying for a time the more distressing symptoms. Various other sedative medicines may be exhibited; as for example, hydrocyanic acid, conium, belladonna, the preparations of morphia and of opium. These are usually given in some mucilaginous vehicle. Dr. Stokes prescribes a mixture containing camphor, valerian, opium, æther, and ammonia.

Local pains in the side may be relieved by warm poultices and fomentations. Diarrhœa is to be checked by astringent remedies, such as compound powder of kino, or of chalk, or

the trisnitrate of bismuth, the tannic and gallic acids are useful in checking diarrhoea, as also night perspiration. Different medicines have been suggested for the purposes of inhalation, but their utility is very questionable. They often indeed aggravate the cough by their irritant qualities. Among these may be mentioned chlorine, iodine, tar vapour, and the like : an exception might be made in favour of warm water containing some mild sedative or narcotic.

The diet in the early stage should be nutritious and easy of digestion, but by no means stimulating. It may consist of the various articles of farinaceous food prepared with milk, for breakfast, cocoa with milk, instead of tea, as also new laid eggs softly boiled ; light nourishing broths, and jellies (without wine) ; some kinds of fish—as, whiting, skate, sole, and likewise flesh of chicken, or young pork ; which latter, contrary to received opinions, is easily digested ; when

is wine desirable, the light wines of the south of France, are preferable to the full bodied wines of Spain and Portugal. When the tubercles are softening and cavities forming, the constitutional powers will often require supporting, and a more liberal diet may be permitted, as also two or three glasses of sound claret, or even a glass of light bitter beer; at this period the patient will bear, advantageously, a gentle tonic, counter-irritation being kept up at the same time.

The invalid ought to occupy a room heated by warm water-pipes rather than by coal or wood, as the mild warmth from this source will prove less irritating to the mucous membrane. For the purpose of lighting, oil lamps or wax candles are preferable to common gas. The sitting-room should be kept at a temperature of about sixty-four or five degrees Fahrenheit, should be lofty, and well ventilated. The sleeping apartment should have a southern aspect, be also spacious, and



the bed a French mattress on an elastic-spring mattress.

Life, in numerous instances, may be prolonged by removal to mild quarters during six months of the year, viz., from the middle of October to the middle or end of April. The practice of sending patients from their homes and friends to die in a foreign land cannot be too strongly reprobated. Hence change of climate should be only resorted to when there is every probability of good accruing from it, and not when the last stage of disease has arrived, and it is evident that the mortal career of the poor sufferer must close in a few days, or, at most, weeks.



PART III.

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DISEASES OF THE HEART

AND

ANEURISM OF THE AORTA.



## PART III.

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### DISEASES OF THE HEART.

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DISEASES of the heart may be conveniently divided into two categories, the *inflammatory*, and the *non-inflammatory*, the latter being again sub-divided into the structural and functional.

The diseases of an inflammatory character are of primary importance, these are inflammation of the investing membrane, the lining membrane, and substance of the heart, *pericarditis*, *endocarditis*, and *myocarditis*. .

The non-inflammatory diseases which



affect the structure of the heart are scarcely less important than the inflammatory. These may be marked by increase of strength and substance, *hypertrophy*, or by the loss of strength and substance, the last are generally marked by enlargement of the cavities of the heart, *dilatation*. The heart may be weakened with or without change of structure; in the former case the change which is infinitely more common than any other is one which is well expressed in its name, *fatty degeneration*. Under this head of structural weakening of the heart are included the peculiar softening which has place in typhus fever, to which attention has been particularly drawn by Louis and Stokes, and the softening which has place in some cases of scurvy and anæmia, but our limit will not allow any notice of these changes except what is incidentally in the chapter on fatty degeneration.

The non-inflammatory diseases which are

unattended with any *necessary* structural change, are *angina pectoris* and *nervous palpitation*, mere syncope does not require any special notice as it is only a symptom.

In conclusion, some remarks will be made upon *aneurism of the thoracic aorta*, an affection which, though not properly belonging to the heart or the lungs, can not be passed over in silence in a treatise like the present.

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#### *Inflammatory Diseases of the Heart.*

Inflammation may separately attack the investing membrane, the lining membrane, and the substance of the heart, but most generally all these structures are more or less implicated, though the brunt of the disorder may fall upon one of them. The subject, however, is so complicated that it is necessary to consider each kind of inflammation as a separate disorder.

*Pericarditis.*

This affection occurs most frequently in connexion with rheumatism, and very frequently in connexion with disease of the lungs, or their investing membrane. In all these affections we must be carefully on the look out for its occurrence. It is, however, occasionally the result of violence and sometimes, but very rarely, as an idiopathic disorder. Pericarditis, however, may practically be regarded as the companion if not the relation of rheumatism, for it has been shown on very good authority, that they are associated in the proportion of at least 12 to 1.

The symptoms of pericarditis are often obscure. The attack may begin insidiously and great mischief be done before it is detected. The open attack is marked by high fever, sudden and acute pain in the region of the heart, tumultuous and irregular palpitation, inadequate pulse, and great and

peculiar anxiety. The pain is increased by pressing on the superadjacent intercostal spaces, or under the lower edge of the corresponding false ribs; the pulse at first is generally excited and irregular, the breathing difficult and accelerated, attended with cough and pain referred to the left shoulder; the patient cannot lie on the left side, often there is difficulty of swallowing and sympathetic vomiting, and not unfrequently, particularly in rheumatic cases, there is delirious excitement of the brain, and that to such an extent in many cases, as to draw off the attention from the real malady in the heart. Eventually the symptoms of fever and excitement pass off, and give place to those of extreme weakness, the pulse flutters, the skin becomes cool and clammy, the jugulars stand out and sometimes pulsate, the difficulty of breathing becomes agonising, disposition to faint extreme, and all this while the patient is perfectly still,

though in no one constant position, because the least motion excites the heart and increases his distress.

The physical signs of this disorder are by no means obscure, not unfrequently the rubbing of the dry and roughened heart against the dry and roughened pericardium communicate a distinct sense of friction to the hand. This friction conveys to the ear a creaking sound, as of new leather, of varying intensity. This is heard first of all at the base of the heart, and thence extends over the whole cardiac surface. As a rule this sound is not heard beyond the region of the heart. This rubbing sound may sometimes mask the natural sounds of the heart, and sometimes it may simulate the double blowing sound consequent upon aortic patency (of which more presently), but generally it is sufficiently characteristic. As the disease progresses the rubbing sound ceases, either from the agglutination of the



opposed surfaces of the pericardium, or from their separation by an effused fluid of various kinds, in which case the creak gradually disappears from below upwards, as the sac fills. When effusion has taken place another order of phenomena is presented. The natural dulness of the heart on percussion is found to be increased, and the natural sounds are obscured, the latter change being owing partly to the impediment which the fluid opposes to their transmission, and partly to the weakened state of the heart itself. This change is all the more marked because the sounds of the heart are usually increased at first. When the fluid is becoming absorbed the heart's sounds regain their natural character by degrees, and at last, when the pericardial layers come in contact, the friction sound is reproduced, the first sign of it being at the base, as may readily be understood.

Those sounds are all greatly modified



in cases of pericarditis consequent upon the extension of an ulcer into the pericardium, where air has found its way into the sac, but these cases are of great rarity.

In actual practice, however, pericarditis is almost invariably associated with some degree of endocarditis, and hence the true signs of the former affection will be complicated with the various blowing and other sounds of the latter affection of which we shall have to speak presently. Sometimes the sounds of endocardiac blowing may be mistaken for those of pericardiac friction, but the latter may generally be distinguished by the ready way they are made to disappear, viz., under the local abstraction of blood, and by that in which they may be intensified, by exerting slight pressure with the stethoscope over the region of the heart, so as to press the two surfaces of the pericardium into closer contact, or (what has virtually the same effect) by causing the patient to lean for-

wards. This last fact is of considerable importance in the diagnosis, for it often happens that in persons whose chests are slender, as in women and young children, that in this way the friction sound may be reproduced after it has ceased, in consequence of some fluid effusion into the sac. Sometimes, again, the rubbing sound of pleurisy may be mistaken for that of pericarditis, but this will cease on suspending the respiration, except in those few and almost hypothetical cases in which the inflamed pleura, near the heart, may give out a friction sound by the heart knocking against it.

Dr. Hope says that the heart acquires "a jogging or tumultuous motion" when the pericardiac surfaces become adherent, but this is by no means certain. Others attempt to diagnose this change by the sudden cessation of friction, without any signs of effusion, but this is less easy than it seems. Others, again, think they can see an un-

natural drawing in of the intercostal spaces to which the pericardium is related synchronously with the heart's action, and this is perhaps possible in cases of old standing, but, to say the least, it has been rarely observed. Such are the more prominent features of pericarditis, but it is to be remembered that these features vary greatly, and that those which are furnished by auscultation are those upon which dependance alone can be placed. Sometimes all active symptoms may be absent and the affection be altogether of a chronic character. Sometimes even inflammation in any form may be doubtful, and the symptoms be those of a dropsical character—Hydropericardium.

The appearances after death are very various. The pericardium may be dotted with white spots and small adhesions, the subserous texture may be thickened and vascular, so as to allow the serous membrane to be readily stripped off. Fluid may be

present in the sac varying both in quantity and quality ; in quantity from a few ounces to six or seven pounds, in quality from limpid serum to limphy serum, pus, and blood. Air may even be present, if the pericarditis has been the consequence of the extension of ulceration, either from the surface of the body or from the lungs. The pericardium may be coated with lymph, the surface of which has a plush like character in consequence of the friction to which it has been subjected, or the effusion of lymph may be more abundant, and the sac itself more or less obliterated by the organised products. In cases of old standing these lymphous deposits may take the form of tubercle, fibro-cartilage, cartilage, or bone. The muscle subjacent to the inflamed membrane is usually, to some extent, changed, being, as a rule, softer and paler than natural. Or, in older cases, the heart itself may be atrophied by the contraction of false mem-

brane, or else dilated in consequence of the indirect or direct injury done to its muscular tone. Besides all these, there are the proper signs of endocarditis in almost every instance, and of these anon.

The favourite mode of treatment, and that which has been carried out most fully by Bouillaud, is that by free venesection. But great discrimination is required to use this powerful remedy, as the time when the heart begins to flag in its action, often supervenes very rapidly, and long before it might be expected. Certainly it is necessary to be infinitely more cautious than in pleurisy. After general bleeding, local bleeding is desirable, particularly after the plan recommended by Dr. Latham, viz., by cupping in the back. This produces much less distress than by interfering over the actual region of the heart. Bouillaud recommends the application of repeated warm poultices, and this practice is often followed with very



marked relief. Along with this treatment no time is to be lost in getting the patient under the influence of mercury, indeed mercury is as indispensable as blood-letting, if not more so, and it is surprising how the loss of blood may be economised, and how speedily and effectually the inflammation may be mastered, by the prompt and bold use of calomel. In France the lancet is trusted to almost exclusively in these cases, and the results are infinitely less satisfactory than those with which we are familiar. Along with mercury, salines, antimony, and frequently colchicum will have to be associated. Digitalis is a remedy of great value, but its employment requires some tact. The received and correct opinion is that it is of no use while there are symptoms of fever or inflammation, or when the heart is much weakened, perhaps under these circumstances hydrocyanic acid is more eligible. Some of the preparations of aconite are



said to be useful in subduing vascular and excessive action when any kind of depletion would not be admissible.

In the second stage dependence must be placed upon counter-irritants and the judicious use of alkalies and turpentine. Absolute rest is necessary in all cases.

The most difficult question in connexion with the treatment relates to the employment of stimulants, and few rules are laid down by authors on this subject, Dr. Stokes perhaps excepted. His remarks upon this subject are of extreme value. He is "convinced that cases are often lost from the want of proper stimulation at the right time," and in every case of dangerous pericarditis he urges that "we should be anxiously on the watch for the moment when the weakened heart requires to be supported and invigorated." (*Diseases of the Heart and Aorta*. Dublin, 1854, p. 87.)

In some very rare cases tapping may be a

*dernier resort.* This operation was suggested by Sevac and performed by Desault, and since their time by more than one person, with the effect of relieving distress, prolonging and perhaps saving life—for all the patients did not die. Experience, indeed, has shown that the operation is practicable, and perhaps in some rare cases justifiable, but this can only be in very rare cases and under very peculiar circumstances.

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*Endocarditis.*

Endocarditis, or inflammation of the lining membrane of the heart, is generally associated with pericarditis, but not invariably. It is equally the almost constant sequence of rheumatism. It is also the far more common consequence of this affection, though this fact is not commonly understood. "It appears," says Dr. Latham, "from cases sufficiently numerous that endocarditis oc-

curs nine times in acute rheumatism, for pericarditis once, that simple endocarditis constitutes more than two-thirds of all rheumatic cardiac affections, and simple pericarditis only one-thirteenth, and that pericarditis is more frequently found in combination with endocarditis than alone." (Lectures on Diseases of the Heart. London 1845, p. 145.) Endocarditis is not unfrequently an accompaniment of inflammation of the lungs or pleura, and sometimes it is connected with inflammation of the veins, the inflammation being carried into the heart by a direct extension along the lining membrane of the veins. It is to be understood, however, that the diseased condition of the valves, which are the most prominent consequences of endocarditis, and the physical signs of which are the chief means of diagnosing the affection, may occur, and do often occur, without any inflammation at all. Some of these diseased conditions,

as the atheromatous changes, more especially seem to relate to the very opposite of inflammation. The valves are often strained or ruptured by some violent exertion, as Dr. Latham has well shown.

The general symptoms in an acute case are in great part those of phlebitis, generally there is high fever and acute local pain, there being at the same time the greatest contrast between the violence of the action of the heart, and the feebleness and irregularity of the pulse. This contrast is owing either to spasmodic constriction of the orifices of the ventricle, or to some inflammatory change by which the free transit of blood is prevented, or else it is owing to the partial coagulation of blood within the chambers of the heart. All these causes may co-operate, and the last particularly towards the close of the case. The remaining symptoms are the natural consequences of this state of things—paleness and coolness of the

skin, utter inability to sleep, anxiety amounting to horror, extreme tendency to syncope.

In some instances (sometimes when there is no endocarditis) the chordæ tendinæ may give way, and the patient either die at once, or linger on in great distress for a short while, this accident generally occurs during some great exertion. The symptoms are sudden cardiac anguish, with the sense that something in the heart has given way, tumultuous palpitation, orthopnœa, with extreme restlessness and agitation.

The physical signs of this affection are very marked, the heart communicates a sensible thrill to the wall of the chest, the natural dulness is increased, the impulse is violent, and often of a peculiar ringing character, the natural sounds are obscured, or altogether masked by a *bruit* of variable intensity and character, which bruit is caused by the transmission of the blood



through the altered orifice. This last sign is the characteristic sign, for though it is occasionally absent, yet this is a very rare matter, the sound of bellows blowing, of filing, rasping, sawing, or of whistling, and cooing, may be all imitated by this bruit, but the individual character of the sound is of little moment, for it often changes, and is related to no one special kind of injury.

In the chronic forms of endocarditis the symptoms have a different character. The patient suffers from paroxysmal pain, in the region of the heart, more or less constant palpitation, fits of dyspnœa, and of tendency to syncope, with great feebleness and irregularity of the pulse, and if the disease is of any standing, he also suffers from the variable symptoms of venous congestion, such as anasarca, distended or pulsating jugulars, congested lungs, liver, &c. In these



cases, however, as in those of an acute character, the ground signs are the sounds derived from changes in the valvular orifices of the heart, where indeed, the seat of the inflammation always lies.

Now endocarditis is scarcely, if ever, spread equally over the whole of the interior of the heart. It affects rather the orifices, and not all these at the same time, or in the same degree, and as it is possible to ascertain the actual seat of the malady, and as it is expedient to do so, we will proceed to consider the means by which this may be done.

The rules by which the diagnosis of special valvular disease is made out, have been compiled by various observers, each of whom have contributed something to the general stock of knowledge, and these are laid down at great length, in various treatises on the subject. Dr. Watson, how-

ever, has removed a good deal of their complexity, in his admirable lectures on the practice of physic.

Now the main sign of valvular disease, is a certain blowing, rasping, sawing, cooing, and other bruit, caused by the blood passing through an altered orifice, and the object is to detect the source of this bruit.

First of all, then, it is proved by the researches of pathological anatomy, that valvular disease of the heart is extremely rare on the right side, the disease in nineteen cases out of every twenty being on the left side, the probability, therefore, is, that the bruit belongs to the left side, and the question is whether it is connected with the sigmoid or the mitral valves.

If, then, *the bruit accompanies the systole*, it is caused by blood *passing out* of the ventricle, this may be, (1) from the aortic orifice being constricted, or otherwise altered, or, (2) from the mitral valve being imperfect

and insufficient to prevent the blood from regurgitating into the auricle. In the first case, the bruit is heard most distinctly at the base of the heart, and in the course of the aorta, and not at the apex; in the second case, it is heard at the apex, and not at the base, and in the course of the aorta, the pulse also is very different in the two cases. In aortic constriction, the pulse is not remarkably affected, except the disease be very great, in mitral patency it is extremely irregular and unsatisfactory, the only difference would be if the disease were on the right side of the heart, instead of the left, that the radial pulse would not be affected in this manner: a bruit connected with the semilunar valves would be heard in the course of the pulmonary artery, and not in that of the aorta; and a bruit connected with the transfixid valves over the region of the right ventricle, and not at that which corresponds to the left; and this

difference might be made out by careful auscultation, but only by *very careful* auscultation.

If, on the other hand, *the bruit accompanies the diastole*, it is caused by blood *entering* the ventricle, either (1) through a narrowed opening, or else (2) through a patent aortic orifice, the sigmoid valves having become insufficient to prevent regurgitation. Now in this case, the same rules are applicable as in the other. If the bruit is at the auriculo-ventricular opening it will be heard most at the apex of the heart, and if at the aortic orifice, at the base, and in the course of the vessel. The whole probabilities likewise, are against the disease being on the right side. Indeed, it is doubted by some whether diastolic bruit are ever heard on this side. If the bruit is caused by aortic regurgitation, the pulse is very characteristic, the sensation communicated to the finger,

being very like that caused by inverting a "water hammer," the sudden departure of this natural impulse is owing to the partial regurgitation of blood into the heart at the diastole. In these cases of aortic patency also, the second sound of the heart (which seems to be mainly due to the sudden flopping back of the sigmoid valves) is generally absent, the information respecting the right side of the heart is less precise, no bruits have been demonstrated, and all that can be said is, that when the tricuspid valve is patent, there is distension of the venæ cavæ, and their tributaries, and often a visible pulsation in them, even in the external jugulars. It is to be understood, however, that this patency, and the consequent engorgement of the great veins, is often a salutary provision to prevent undue engorgement of the pulmonary circulation, and that the heart has been constructed



with a view to this end. This was pointed out by Mr. Hunter, and more recently by Mr. King.

There are no means of distinguishing the special nature of any valvular disease.

The dangers of endocarditis are very great and varied, danger of relapse may be mentioned, as first on the list; in acute cases there is danger of speedy death, from exhaustion of this muscular irritability of the heart, from spasmodic or structural obstruction of the orifices, or from clogging up of the cavities, with coagula. In some of these cases death has been brought about by rupture of the chordæ tendinæ. In other cases there is danger that there will be permanent mischief in the outlets, with its appropriate bruits and other signs, and this will lead to hypertrophy, or more probably, to dilatation and all the other serious consequences of venous engorgement, and through these to sudden death, though sud-

den death in these kind of cases is not so common an issue as is usually supposed. In some instances very serious mischief has ensued from the detachment of a fibrinous fragment from a diseased valve, and its impaction in one or other of the vessels. In this way the supply of blood has been cut off from an important organ, as the brain, and death has been hastened. Several cases of this kind have been collected by Dr. Rükle and Dr. Senhouse Kirkes.

The changes which remain after death, are generally limited to the left side of the heart, a fact which may be partly ascribed to the more abundant distribution of fibrous tissue on this side, and what changes there are, for the most part are limited to the valves, these may be redder than natural, thickened, stiff, puckered, covered with various excrescences, glued to each other or neighbouring parts. The deposit may have every character, from soft and organised

lymph, to atheromatous or osseous matter, though these last named changes do not belong immediately to inflammation. The chordæ tendinæ may be puckered or lacerated. Fibrinous coagula may be met with, and these may be laminated or filled with pus, or a liquid like pus, adherent and half organised, so as to look like polypi. In connexion with these coagula, also there is often a hyper-fibronised condition of the blood, and the vessels generally are filled with coagula. Ulceration is not uncommon in some of the older cases, and this may have gone on to actual rupture. Bouillaud thinks that gangrene is possible in most acute cases, but this is not yet a matter of demonstration.

The treatment of endocarditis must be directed by the same rules as pericarditis. Bleeding, however, must be conducted with great caution, there can, however, be but one opinion of the treatment by Bouillaud,

the indiscriminate depletions cannot be too forcibly condemned, the chief argument against his practice would be the tendency to syncope, and the danger that the blood (already prone to coagulate from its hyperfibrinization,) would clog up the chambers of the heart in these periods of comparative inactivity. Great care is of course necessary not to confound the symptoms of actual inflammation with the consequences of inflammation.

### *Myocarditis.*

Inflammation of the muscular substance of the heart, independently of inflammation of the lining or investing membrane, is of very rare occurrence, and but little is known about it. The muscle of the heart is always superficially implicated in pericarditis and endocarditis. Partial inflammation is also implied in the presence of the ulcerations,

which are sometimes connected with diseased valves, which ulcers may go on to the entire perforation of the muscular wall. But a more extended inflammation is possible, as may be gathered from the particulars of a case described by Mr. Stanley in 1816, in which the entire heart was deeply congested, softened and infiltrated with pus, and from other cases in which sanguineous or purulent deposits have been found in the heart, though in some of these latter, the deposits may have been secondary in their character.

The altered condition of the heart in typhus fever, has been referred to inflammation by some, and the researches of Louis and Stokes connect this change with a process which is altogether opposed to inflammation in its nature.

The symptoms of myocarditis are in no way pathognomic, and all that can be said about them is, that this condition may be suspected when there is pain in the heart,

tumultuous and irregular palpitation, inadequate pulse and anguish, *without* the special signs of pericarditis and endocarditis. Dr. Stokes relates some cases of this affection in which one of the sounds of the heart—generally the second—was doubled, but this phenomenon, which is very obscure in its nature can scarcely be regarded as pathognomic.

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#### NON-INFLAMMATORY DISEASES OF THE HEART.

##### *Affecting the Structure of the Heart.*

##### 1. *Hypertrophy.*

Simple uncomplicated hypertrophy is a much rarer affection than it is supposed to be; and it is probable that if the natural condition of the heart had been better understood, particularly the variations in size, much less would have been written on the subject. It is natural that the heart should obey the same law as other muscles,



and increase in size when it has an unusual amount of work, and undoubtedly hypertrophy may arise from this cause, in persons who run much, or row much in wager matches; this latter is a very fruitful source of hypertrophy, as also other diseases of the heart. Again, persons who frequently excite their hearts from mental causes, are predisposed to this disease, but the latter may be considered rare comparatively speaking. On the other hand, hypertrophy complicated with some other disorder, is of daily occurrence. The most common complication is hypertrophy with dilatation, more or less general. Indeed, this may be said to be the only complication, for hypertrophy associated with the opposite condition, and with contraction (the concentric hypertrophy of Laennec) is now known to be merely a *post mortem* contraction of an hypertrophied heart, which passes off with the *rigor mortis*. For these reasons, hypertrophy as a special

plexy and inflammation. The viscera generally are enlarged as the consequence of the exalted nutritive activity, as a rule there is no dyspnœa.

The natural impulse of the heart against the side is increased both in force and extent, the head of the person auscultating is raised by it, and the steady uncontrollable swell is quite characteristic. The impulse, also, is considerably prolonged, and the natural period of rest abbreviated. The systolic sound is fainter and duller than natural, and it is heard only within narrower limits than usual, but the diastolic sound is little altered. Sometimes the increased size of the heart causes a sensible bulging of the chest.

These are, of course, the symptoms of hypertrophy of the left ventricle, which is the part generally affected. If hypertrophy of the right ventricle is superadded, or exists by itself, it will lead to symptoms of pul-

monary engorgement. Of hypertrophy of the auricles nothing is known. There may be a jugular distension and pulsation, and there may be increased dulness on percussion, for in some cases of auricular distension on the right side, consequent upon tricuspid patency, this increased dulness has been so marked as to give rise to the idea of interthoracic aneurism.

In hypertrophy with valvular disease, none of the general symptoms may be present. In many of these cases, indeed, the enlargement of the heart is salutary, and no more than sufficient to counteract the valvular impediment, and keep up the circulation at the natural pitch of activity. In these cases, indeed, this natural tendency of the disorder is not to hyper-activity of the circulation but to the contrary, namely, to all those symptoms of venous congestion which will be spoken of when treating of dilatation of the heart. The most serious

change connected with hypertrophy is apoplexy, and Dr. Clendenning says that he found this condition of the brain in not less than three-fourths of the fatal cases examined by him.

The state of the heart after death is very variable, the weight may be treble that of the healthy heart, which weight is from 8 to 9 ounces for the adult male, and an ounce less for the adult female. The brunt of the affection generally falls upon the left ventricle, and the *carnæ columnæ*, as well as the true walls are usually affected equally. Indeed the right is rarely affected in any very considerable degree, except in cases where the foramen ovale remains open.

The treatment will of course vary considerably in the two classes of cases which have been described. Under any circumstances, however, and in the purest conditions of hypertrophy, the plan once in vogue which was recommended by Valsalva and



and Albertini, of keeping the patient in bed and continually pressing him to the verge of the grave by dint of bleeding and starving, is altogether out of the question. This kind of heroic treatment is now known to do harm rather than good. Dr. Hope recommends the temperate use of an antiphlogistic but not debilitating diet, with as little liquid as possible and this water, together with occasional small venesections and leechings, when symptoms of dyspnœa or plethora require it. He also endeavours to act upon the kidneys by saline diuretics, this mode of treatment with the rest of body and mind, which is necessary under any circumstances, is a very good one, but the practitioner will always have to exercise a good deal of tact, to know when to leave nature to do her own work.

There is much difference of opinion as to the virtues of digitalis. Laennec disapproves of the drug altogether, while

Bouillaud, Hope, and the majority of writers on the subject are warm in its praises. Bouillaud styles it the true opiate of the heart, and he uses it endemically to the extent of from 6 to 15 grains a day. Experience, however, has abundantly shown that it cannot be given with advantage when there is much irritation, and that at such times hydrocyanic acid may be substituted with decided benefit. Hope recommends aconite when there is much pain. Of the latter drug there can be no question of its usefulness, particularly when you want to subdue vascular action attended with pain and fever, when blood-letting is inadmissible.

Local anodyne applications, such as belladonna plasters, are very useful in allaying pain, much more useful than any form of counter-irritation. Cupping at the back will frequently relieve pain, while cupping in front most generally aggravates the suffer-



ing. Any special irritation must be treated on general principles.

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## 2. *Dilatation.*

Primary idiopathic dilatation is an extremely rare affection: but secondary dilatation is the most common, as it is the most serious affection of the heart. It is usually associated with more or less hypertrophy. Secondary dilatation, according to Dr. Stokes, may be dependent upon, 1, disease in the cardiac orifices (mainly that kind of disease which allows regurgitation), 2, upon obstruction to the circulation in organs remote from the heart, and 3, upon inherent weakness in the cardiac muscle. The subjects of this affection are usually enfeebled from one cause or another, often from age, often from gout, their general health being very languid, and their whole bodily and mental powers depressed.

The symptoms of dilated heart are eminently paroxysmal, and these are all without exception indicative of venous engorgement. In the fit the heart palpitates flutteringly, and is irregular, the pulse is extremely weak, the skin is dusky and cool, the countenance bloated and anxious, the jugulars distended and often pulsating. Perhaps there is some delirium. Perhaps the urine is suppressed. There is much dyspnœa from the retardation of blood in the lungs, and owing to the same cause the liver undergoes a remarkably temporary dilatation, somewhat similar to that of the spleen in the cold stage of ague. This last stage has been particularly dwelt upon by Dr. Stokes, (op. cit. p.)

During this time the impulse of the heart is extremely feeble, or else altogether imperceptible, and the natural sounds are mostly confused, owing to the tumultuous and irregular rhythm of the organ. In the

interval all these distressing symptoms may pass off completely, the liver collapsing to its normal limit, and the heart returning to its normal state, so far as we are able to know to the contrary. If, however, the heart do not recover itself, and there is decided dilatation, the pulse continues to be irregular, unequal, weak, small, or slow, and the impulse feeble, while the sounds are very much alike in character, and the intermediate period of silence is prolonged. In advanced stages of the disease, the heart, lungs, liver, and kidneys, are permanently engorged, and anasarca is superadded to the other symptoms of debility.

In dilatation of the heart the appearances after death are somewhat varied. Organic disease in the valves is comparatively rare, but the valves are occasionally insufficient from the separation of the walls to which they are attached. These walls are usually thinned, often they are flabby, pale, with the

sign of fatty degeneration. Sometimes they exhibit partial dilatations (cardiac aneurism), and this, like other aneurisms, may have gone on to rupture. These aneurisms have only been noticed in the left ventricle, and they have never been diagnosed during life. They are not uncommon, and rupture of the heart from their bursting, is, next to fatty degeneration, the commonest cause of this terrible accident. The columnæ carneæ are usually elongated and attenuated. The several viscera and the veins generally, are gorged with dark blood.

In the treatment of this disorder everything is to be avoided which will impair, and everything sought after which will recruit, the strength of the system, for this is the only way in which we can hope to impart tone to the weakened heart. Quiet, good food, tonics, particularly steel, are indispensable; wine also is essential, though this is not invariably admitted to be the

case. It is indispensable, indeed, in fair quantities; and it is only he who has carefully watched the effects of wine upon the debilitated heart, whether this heart be met with in the state under consideration, or in typhus fever, or in fatty degeneration, who can know, how tolerant the heart is of stimulants, and how it requires them in order to get through its arduous duty. In the paroxysm, everything depends upon the prompt administration of stimulants—ether and other diffusible stimulants, sweet spirits of nitre, hot coffee, gin, and others, those being preferred which have a diuretic action. In the interval the special symptoms must be treated, and particularly the condition of the heart. For this point of practice we are indebted to Dr. Stokes, who recommends, under these circumstances, the occasional employment of alterative doses of mercury. By this treatment this physician was enabled to relieve several of his pa-



tients (some of whom were mercurialised several times) and to procure the action of diuretics and other appropriate remedies, when without it he would make no progress at all. This result is indeed intelligible to some extent when it is remembered how amazingly the liver becomes congested in some of these cases. The mercury may rouse the gland to a more vigorous action.

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### 3. *Fatty Degeneration.*

At the present day this affection is attracting especial attention; and properly so, for there is every reason to believe that it is one of very common occurrence. Fatty degeneration appears to be entirely opposed to inflammation in its essence, and so far as can be gathered from existing evidence, it is a change which may happen whenever the vitality of the heart is reduced to a lower degree of vitality than normal, and



which under certain circumstances may happen equally in the dead heart, when that heart is converted into adipocere. "The molecular fatty matter," writes Dr. Quain, "in the fibre is the result of a chemical or physical change in the composition of the muscle itself, independent of the processes which we call vital." (*Medico-Chi. Trans.*, Vol. xxxiii., p. 140.) One thing is certain, and that is, that this disease is met with in persons of advanced age, particularly if bedridden, in consumptive patients, in people whose constitutions furnish indications of gout or scrofula, in those whose strength is shattered from any cause, often in association with atheromatous changes in the aorta and other vessels, and in connexion with a faulty nutrition of the heart itself from ossified coronary arteries, and some other causes; but never in persons whose constitutions are whole and hearty.

The diagnosis between this disorder and simple weakness is often impossible. There may, and probably will be, all the symptoms of venous engorgement consequent upon the failure in the mainspring of the circulation. The heart's impulse is feeble and sluggish; this is perhaps the main fact. In extreme cases both sounds may be absent, in ordinary cases the first sound is often replaced by the bellows murmur, not regurgitant. Sometimes the pulse is remarkably slow, from 50 to 80, at others irregular and feeble; in some instances it has been altogether imperceptible for some time before death. It is never otherwise than feeble. There are also repeated attacks of faintness and faintings, and occasionally symptoms of the nature of angina pectoris.

Transient apoplectic symptoms, not followed by paralysis, must also be reckoned among the symptoms of fatty degeneration of the heart. These are clearly owing to

the defective supply of blood to the brain, rather than to venous engorgement in that organ, for in several instances recorded, the patient has been able to avert these attacks *by holding down his head.*

A marked disposition to sigh and to actual pauses in the breathing, is another symptom, and a very important, if not diagnostic one, if the heart has never exhibited any signs of inflammation. Dyspnœa on slight exertion belongs to the same category. Besides this, according to Dr. Stokes, there is "a form of respiratory distress, peculiar to this affection, consisting of a period of apparently perfect apnœa, succeeded by feeble and short inspirations, which gradually increase in strength and depth, until the respiratory act is carried to the highest pitch of which it seems capable; when the respirations, pursuing a descending scale, regularly diminish until the commencement of another apnœal period. During the

height of the paroxysm the vesicular murmur becomes intensely puerile." (Op. cit. 336.)

The arcus senilis, which has been shewn to be a form of fatty degeneration, has been thought to be a corroboration of this disease of the heart, and it may fairly be regarded in this light; but some recent American statistics go to show, that the arcus senilis may exist and the heart be perfectly healthy.

The dangers of fatty degeneration are pretty much the same as those of ordinary cardiac weakness. Statistics, however, go to show that *rupture* of the heart is much more commonly connected with this than any other condition.

Fatty degeneration is often found after death to be associated with atheromatous, tuberculous, or gouty changes. Any inflammatory alterations, or any disease of the valves are accidental. Ossification or oblite-

ration of the coronary arteries is very frequent, but by no means constant. In the earlier stages of this affection, the change cannot be detected by the naked eye; in the last stages the muscle has lost its natural redness and becomes yellow. Microscopically minute oil globules are detected in the sarcolemma, and these globules replace entirely or in part, the true muscular substance. Oil is often found in the blood vessels, and even infiltrated in the soft solids and the bones. Dr. Stokes has also pointed out the presence of inflammable air in the body shortly after death, and in quantities sufficient to cause a heavy viscus, such as the liver, to float upon water; a curious fact, which when taken in connexion with the superabundant presence of oily matter in these bodies, causes him to ask whether spontaneous combustion might not be possible under these circumstances. Besides



these appearances white softening of the brain has been noticed in many cases.

The only hope of good in any of these cases is in recruiting the general health, and in adopting those measures, more particularly those which favour muscular development, such as exercise short of fatigue, if the person be young, and in the abundant use of animal food; wine will be indispensable for the reasons pointed out in the last chapter, and especially in elderly persons. Indeed, to apply Dr. Stokes's rule in fever, wine is indispensable in exact ratio to the want of impulse and systolic sound. More powerful stimulants will be required in the paroxysms, and steel and probably colchicum will be of great value in the intervals; for often in these cases there is a gouty tendency which interferes greatly with healthy nutrition.



*Non-inflammatory Diseases of the Heart without any necessary structural change.*

*4. Angina Pectoris.*

Diverse opinions are held as to the nature of this most distressing and serious affection, some maintaining that it is a purely nervous affection, and others that it is symptomatic of organic disorder. All the probabilities, however, are against the former opinion, and most generally there is unequivocal structural disease. Thus in forty-five cases, of which post-mortem examinations were made, Sir John Forbes found organic disease in 39. (Cyclop. of Prac. Medicine.) Again, out of 54 cases collected by the same observer, only 12 were under 50; and out of 86 cases 80 were men, facts which of themselves are sufficient to explode the idea, that the disorder is of a merely nervous character. Angina pectoris, however, is not associated

with any one single change, except that be weakness. This state, indeed, is always present, and it is often denoted by fatty degeneration, by ossification or obliteration of the coronary arteries, or some other unequivocal sign. Disease of the coronary arteries is very common, but not so common as it was once supposed to be.

A well-defined paroxysm of angina pectoris (which is not very common) is marked by sudden and agonising precordial pain, occurring often during some unusual exertion, and attended by a horrible impression of impending death. The countenance is pale and horror-stricken, the breathing is unaffected, and the patient is able to inspire and expire without much difficulty, which distinguishes the affection from asthma. Besides these, there is generally a feeling of numbness or pain in the left arm. The paroxysm is not unfrequently fatal, even in the first instance; but if not, it passes off

as suddenly as it began, and ends in a copious secretion of limpid urine, and in as free a discharge of flatus from the stomach and bowels.

The actual condition of the heart in these paroxysms is not determined, some holding that it is one of spasm, others, that it is one of paralysis and over-distension of its cavities.

The treatment must be conducted on general principles. In the paroxysms all that can be done is to have recourse to the most vigorous stimulation, both externally and internally. Dr. Latham adds a large dose of laudanum, 30 to 60 minims, to the stimulant. Dr. Elliotson is disposed to trust to hydrocyanic acid, but this remedy is more than questionable under the circumstances. As an external application during the continuance of the paroxysm, equal parts of camphorated spirit and laudanum, applied hot through flannels

wrung out of it, mustard poultices with laudanum, hot turpentine, and embrocations containing chloroform, are all useful adjuncts in this distressing and too fatal disorder. In the interval all must be done that can be done to brace the system, and possibly much good may accrue from wearing habitually an opiate or belladonna plaster over the region of the heart. A seton has been recommended, but it must be confessed, with very doubtful efficacious results. The disease is not very common, indeed it may be considered rare, and would seem to combine the functional with the organic.

*Neuralgia of the heart* seems to be a slight form of angina pectoris. In these cases there is often a gouty or rheumatic disposition, which is greatly relieved by colchicum.

*5. Nervous Palpitation.*

This affection is of extreme frequency, as connected with hearts that are weak and irritable, but not otherwise damaged, it is also of extreme frequency in connexion with serious cardiac disease.

Nervous palpitation is met with in debilitated and hysterical women, in persons of either sex whose blood is impoverished and scanty, in children or youths who are growing rapidly, and in rheumatic and gouty people, and when suffering from gastric, hepatic, or any other visceral derangement. It is also a symptom of exhaustion, from whatever cause this has arisen, of great prostration, as in fever, and of depression, as from the injudicious use of tea or tobacco.

It is not easy in all cases to decide whether palpitation is purely nervous or not. The main distinction of the nervous



disorder, however, is that the symptom is not constant, and that there are marked healthy intervals, and that the palpitation ceases on active exertion, instead of being aggravated, as it would be if dependent on organic disease. The patient also, as a rule, is young, irritable, or hysterical. The fact that the palpitation is distressing, is no mark of importance, but the *absence* of any rheumatic symptoms is, for if there are these symptoms, or if they have been at any former period, it behoves one to be very careful in saying that the palpitation may not be dependent on organic disease.

There may be various morbid bruits, but these are feeble and changing. The heart's impulse is sudden and jerking, but there is not the steady, irresistible swell of hypertrophy, nor is the pulse as much affected as it would be if the heart's action were really strong. Indeed, smallness and feebleness of the pulse is generally an important mark



of nervous palpitation. The sounds also are for the most part clearer than usual, and they communicate a peculiar ringing sensation to the ear. The treatment, generally resolves itself into the usual means for correcting debility and for remedying any local irritation, the presence of which might tend to excite the heart.

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*Aneurism of the Thoracic Aorta.*

The symptoms of this disease are often very obscure, and much tact has to be used in their detection. The grand sign is the presence of a distinct, localised centre of pulsation in the sternal or subclavicular region, quite distinct from that of the heart, the patient, in fact, appearing as if he had *two* hearts. In advanced cases there is usually a manifest external tumour and a visible pulsation. The impulse in the aneurism is generally much greater than

that of the heart, and it is often very considerable, even when that of the heart is very feeble, a circumstance that was explained in 1834 by Dr. Stokes, on the hydrostatic principle exemplified in the Bramah press, namely, that the injection of a small quantity of fluid into a closed cavity gives rise to a force greatly superior to that by which it was introduced.

The auscultatory sounds are by no means constant. Laennec held that the aneurismal sound was single, but this is not the case; indeed, as a rule, there are two sounds, which are so like those of the heart as only to be distinguished from them by their position and by the presence of the true heart's sounds elsewhere. The sound is generally single, as Laennec says, in aneurisms of the abdomen and of the extremities, but is certainly not so in those which are seated in the thorax. There may be or may not be murmur, and this may be

blowing, sawing, or otherwise, or it may have a peculiar hoarse and abrupt character, but there is no constancy. In fact, murmur is a sign of no importance, except it originate in the sac, and the heart be free from murmur, and then it is necessary to be on one's guard, lest we confound it with one of those local vascular murmurs which are not unfrequently heard in anæmia.

When the sac is behind the heart, Dr. Hope describes a double jogging impulse, and a combination of the cardiac and aneurismal impulses, but this is a sign of little value, seeing that a movement undistinguishable from this may be met with in some cases of valvular and other cardiac disease. Nor is purring tremor or fremitus a common symptom. Such a symptom is met with in those cases in which the sac has opened into one of the large veins, (aneurismal varix) and if occurring suddenly and after effort, along with great distension

of the superior vena cava and its tributaries, and without any previous disease of heart or lungs to account for such symptoms, it is characteristic of aneurismal varix in this situation; but it is not met with, usually at least, in cases of ordinary thoracic aneurism of the thoracic aorta.

Increased dulness on percussion is an important sign in advanced stages of the disease; but even in this case care will be necessary, not to confound the dulness arising from occasional distension of the right auricle with that belonging to aneurism.

Among the concomitant symptoms, pain and difficulty of breathing on exertion, occupy the first rank, and these symptoms are extremely significant if there be no disease of the heart or lungs to account for them. The pain, as a rule, is not violent, and thus it differs completely from that connected with abdominal aneurism, which pain is generally excruciating. The pulse beyond

the aneurism is generally weak or imperceptible, and thus there is often a marked and characteristic difference in the two radial arteries, when, as it generally happens, these arteries arise from trunks which are on different sides of the aneurismal sac. The pulse, also, is subject to very marked attacks of feebleness, owing to a disposition to syncope, which is scarcely ever absent in these cases.

Other symptoms arise out of the displacement, compression, and absorption of neighbouring organs by the pressure of the tumour. The trachea may be pressed upon, and the voice variously altered, or lost. There may be stridor from the same cause, and if there is, the stethoscope will often detect the seat of this as below the larynx, —what is called *stridor from below*. This stridor may exist *without* any affection of the voice, and this circumstance will of itself remove its seat from the larynx. The



trachea may be pressed upon, and the patient suffers from want of breath. Sometimes the pressure may fall upon one bronchus, and cut off the supply of air to one lung, in which case the respiratory murmur will be feeble, and the chest collapse on that side, while the same murmur is puerile, and the chest unusually expanded on the other side. The voice, also, may be affected from stretching or other injury to the recurrent nerve, if the pressure happens to be on the left bronchus. Pressure upon the air passages may also lead to inflammation, sloughing, and their various symptoms. The venous trunks may be pressed upon, and great local engorgement caused in this way; thus the head and arms may be enormously distended, and the trunk and legs pale and shrunken, when the pressure prevents the free escape of blood from the superior cava. The arteries may be pressed upon, and parts may atrophy or die from the want of



the due supply of blood. The thoracic duct, or the œsophagus, may be pressed upon, and the patient may pine away in consequence, there being serious difficulty of swallowing in the latter instance. The spinal column may be pressed upon, and so may the sternum and clavicle, and the bone may be absorbed under the pressure, as well as the soft textures; and when the pressure is directed backwards, there may be pain, paralysis, or various convulsions or convulsive symptoms from the pressure upon the spinal cord and its nerves. The pneumogastric nerve may be pressed upon, and symptoms, such as cough and dyspepsia, may arise therefrom.

The symptoms of thoracic aneurism may be simulated very closely in certain anæmic conditions of the system, particularly when connected with a patent state of the aortic valves, but in this case the want of defined and constant localisation of the pulsation

and impulse, and the frequent extension into the carotids, and other large vessels, together with the symptoms of aortic patency, will help to clear up the diagnosis.

The symptoms of thoracic aneurism may also be simulated by interthoracic encephaloid disease, but in this case the constant progression of the cancerous disease, as contrasted with the aneurismal, which is marked by considerable fluctuations, and by curious transference of the symptoms of pressure from one quarter to another, as the sac tends to point in another direction will help to clear up the diagnosis. Varicose veins, also, are common accompaniments of the cancerous disease, but they are scarcely ever met with in aneurism.

This disease is always mortal, but the mode of death is very various; most generally it is sudden, and from internal or external rupture, but even in this case death may not take place until there has been

several gushes, life being saved for the moment by a formation of coagulum during a state of syncope. Death, however, would appear to be gradual, at least as frequently as it is sudden ; the patient's strength being worn down by pain, want of sleep, or by the various evils which have been described as arising from the pressure of the aneurism upon the neighbouring organs.

With regard to the treatment, the only hope is to be able to avert for some time the fatal issue, and to palliate distressing symptoms. The mad plan of bleeding and starving the patient until he was on the verge of the grave, is now happily abandoned, and experience has shown that it is not only useless, but injurious, to distress the patient in any way. Indeed, now the necessity of rest, and a fair supply of nutritious food, without stimulants, is universally agreed upon.

Symptoms have to be treated on general

principles. Anodynes will be indispensable, and none more so than opium, though it is questionable whether it is well to give it, as it has been given in Germany, either alone or in combination with acetate of lead, with the view of favouring the coagulation of blood in the sac. The local symptoms will require occasional leechings, or counter-irritations, in the form of issues, and sometimes the application of ice or chloroform will be indicated.





## PART IV.

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THE SEVERAL CLIMATES USUALLY  
RESORTED TO

AND

RECOMMENDED IN DISEASES OF THE  
LUNGS AND AIR PASSAGES.



## CLIMATE

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THERE are a variety of circumstances, the combination of which tend to make up the climatic character of a country; many of these are not sufficiently considered by writers and travellers, who affect to describe them. The following observations may show what constitutes and affects the region of a place:—1st, temperature. In noting the temperature of a place it is not sufficient that the mean be taken, but the extremes. Again, the latitude of a place will not represent its thermometric temperature; the sea-shore, the valley, the hill-side, and the mountain, may all be dated from the same latitude. The aspect, whether north or south, will materially

influence the temperature of a place. In the one all the flowers of the temperate zones may flourish, in the other snow may be ever present. It is obvious, therefore, that every conceivable climate may exist under the same latitude.

Sir Henry Holland justly complains of the dearth of positive information respecting the advantage to be derived from climate in disease. I have, therefore, deemed it expedient to present the reader with a concise description of the chief localities of the globe, which have been recommended for their sanative influence in pulmonary ailments, commencing with those situate in Great Britain.

The information has been deduced from the most authentic sources, and will, it is hoped, prove of some utility in directing invalids to a place of sojourn best suited to their individual case.

## THE ISLE OF WIGHT.

THE southern part of the Isle of Wight, the higher southern part, as it was sometimes called, constituting the Undercliff, has long been extolled for the salubrity of its climates.

The Undercliff includes the district which lies between Dunnose on the east, and Rocken End on the west. The western extremity is about two miles more to the south than the eastern, which has the effect of giving the tract an aspect of south-and-by-east to S.S.E. The more favoured spots in this locality have a direct southern



aspect, and are situated in little bays, or coves, as they are called. The principal of these are Ventnor and Bonchurch.

The outline of the Undercliff takes in the range of lofty chalk-capped hills which extend the whole distance from Dunnose to Black Gang, and whose substrata form the striking wall of rock peculiar to the spot. The situation, however, differs materially from a tract surrounded by high lands and forming a valley. Its aspect is more that of a valley sheltered on one side only, and possessing nearly all the advantages of such a locality without being subjected to its drawbacks.\*

Dr. Martin states, in the work just referred to, that he has made the climate of the Undercliff the subject of diligent study during a period of ten years. An abstract

\* The Undercliff of the Isle of Wight, by George A. Martin, M.D., London, 1849.

therefore, of his observations cannot fail to interest the reader.

The *general exposure* of the Undercliff being from S. by E. to S.S.E., affords the most favourable aspect for receiving, during the winter, the whole amount of the sun's rays from its rising to its setting; indeed during this season the sun may be said to be continually on the Undercliff during the day.

The *inclination* of the land, gradually shelving as it does from a height at places of about three hundred feet down to the shore, has the effect of allowing the sun's rays to fall at a less oblique angle during the winter than they would upon a plane surface, and consequently favours the receipt of a greater amount of direct heat.

The *reverberation of heat from naked rocks* also must materially influence the climate; as does likewise the protection afforded by its heights against the pernicious effects of various winds.

The *heat absorbed*, moreover, during the summer months by a soil such as that of the Undercliff is of course considerable; and the radiation which takes place during the winter, from the terrestrial surface, contributes in elevating the winter temperature.

The last source to which reference may be made from whence this spot derives additional warmth in the winter, is the proximity of the wide expanse of the British Channel. The immediate neighbourhood of this mass of water, by its action on the various winds, both moderates the heat of summer, and tends to soften by its influence the rigour of winter.

The mean annual temperature of the Undercliff for ten successive years is exhibited in the subjoined table:—

| Mean. | 1839  | 1840  | 1841  | 1842  | 1843  | 1844  | 1845  | 1846  | 1847  | 1848  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 51.72 | 50.85 | 50.56 | 50.43 | 52.01 | 52.14 | 51.65 | 51.01 | 54.03 | 52.25 | 52.29 |

The extreme difference between the highest mean annual temperature, and the lowest in the table, will be seen to be only  $3^{\circ} 60'$ ; but this is a far greater range than usually occurs, and arises from the very hot season of 1846. If we take the highest annual temperature next in the scale, and compare it with the lowest, we shall find the variation is very much less, and does not exceed  $1^{\circ} 82'$ .

The lowest temperature registered is  $18^{\circ}$ . Severe frost is so uncommon, that the little lake at Bonchurch has been only frozen over four or five times within half a century sufficiently hard to bear.

The *mean* extreme ranges for the year, seasons, and different months, are as follow:—

## MEAN EXTREME RANGES OF TEMPERATURE.

| Year. | SEASONS. |         |         |         |
|-------|----------|---------|---------|---------|
|       | Winter.  | Spring. | Summer. | Autuma. |
| 50'6  | 26'0     | 42'3    | 31'3    | 41'2    |



## MONTHS.

| Jan. | Feb. | Mar. | April. | May. | June. | July. | Aug. | Sep. | Oct. | Nov. | Dec. |
|------|------|------|--------|------|-------|-------|------|------|------|------|------|
| 23·8 | 25·5 | 30·6 | 34·0   | 31·5 | 29·1  | 25·9  | 29·3 | 30·0 | 28·3 | 25·4 | 24·8 |

It will be seen that the extreme range of temperature varies least in the first month of winter, and gradually increases up to April, when it again gradually declines till July.

The mean daily range of temperature is of importance in estimating the value of any particular climate. In this respect that of the Undercliff may claim a superiority over Madeira during the winter months, thus proving its greater equability of temperature.

“ In October the difference is  $1^{\circ} 03$ ; in November it amounts to  $2^{\circ} 98$ ; in December, the first month of winter, the mean daily range of temperature in the Undercliff varies less than that of the same month in Madeira

by  $3^{\circ} 52$ . In January, the mean daily range is less by  $1^{\circ} 69$ , and in February  $1^{\circ} 97$  than it is in Madeira, during the same months." P. 71.

The extreme range of the mean diurnal variation during the whole year is only  $5^{\circ} 88$  which is less than that of Penzance or Cove. The same would apply to the mean annual successive daily range, which amounts only to  $2^{\circ} 39$ , while that of Penzance is  $2^{\circ} 68$ .

The mean height of the barometer for the Undercliff is 29.81 inches.

The atmosphere on the coast is generally supposed to be more damp than that inland, from the greater amount of vapour abstracted from the sea. But owing to the dry and absorbent nature of the soil, as well as the excellent drainage, the amount of moisture is not great at the Undercliff.

The greatest humidity prevails in January, March and April are the two driest months in the year.



The average fall of rain is about an inch more than that of London. The wettest months in the Undercliff are October and November. August comes next in the scale. April is the driest month. More rain seems to fall during the night than in the day.

Dew is sometimes deposited copiously during the nights of summer. Snow does not often fall, nor does it usually remain long on the ground, and the amount is rarely great. "On December 18th, 1841," observes Dr. Martin, "a heavy fall took place, which gradually disappeared on the 19th, leaving hardly a vestige on the 20th; while on the latter day it was quite a foot in depth on the northern side of the hills out of the Undercliff, not a mile distant; and between Newport and Freshwater it was knee-deep. The heaviest fall of snow I find recorded in my meteorological journals occurred on the 20th of March, 1846. It commenced about noon, and continued for three or four hours,

the average depth being  $5\frac{1}{2}$  inches; it measured in the rain gauge, when melted, 0.46 inches, or in round numbers nearly half an inch; the barometer during this time stood at 29.49. Mean temperature  $37^{\circ}$ ; hygrometer at 9 A.M.  $26^{\circ}$ , at 6 P.M.  $31^{\circ}$ , and the wind from N.E. to N.N.E." P. 99.

The next subject connected with the climate of the Undercliff, which demands attention, is the prevailing direction of the winds. It appears that the south-westerly winds predominate all seasons of the year in various proportions, exceeding the easterly even in spring. In winter the southerly and westerly winds prevail over those from the N. and E. by about six days on the average. In spring the winds from the same quarters are nearly balanced.

Sea-fogs, which are deemed prejudicial to invalids with pulmonary ailments, are not of frequent occurrence on this coast. They are principally met with during the last

month of spring and the first of summer, but rarely continue beyond two or three hours.

As a place of winter residence the Undercliff possesses many advantages. It is remarkable for picturesque beauty, and presents a most cheerful aspect. "The number of evergreens which flourish here, together with the luxuriant mantle of its ivy-crowned rocks, takes from the Undercliff, in a great measure, the dreary character of winter; while the highly romantic character of the district, the beauty of which has been so often and so fully descanted upon, adds not a little to amuse, as well as to soothe the mind made irritable or enervated by disease." *Op. Cit.* p. 121.

In addition to the warmth imparted by the rays of the sun, it enjoys also the full influence of its light.

The beach consists of sand or fine shingle, and is unpolluted with mud, or aught to offend the sight or smell.



From the rapidity with which the soil becomes dry, out-of-door exercise is seldom prevented, and the esplanade, which has recently been completed, affords a warm and sheltered promenade-ground for the delicate invalid.

The period of the year in which the Undercliff may be most advantageously resorted to by individuals in quest of health, is from the beginning of October to the end of June. During the latter part of summer and early autumn, it is nowise superior to most other places on the coast.

The climate during the winter months is said to be particularly favourable to persons who have been long sojourners in tropical lands, and especially children. It is reputed as beneficial in a certain class of bronchitic affections, in those cases where the lung has been compressed by pleuritic effusion, and in the prelusive stage of phthisis. This stage is characterised, ac-

according to Dr. Martin, "by pallor alternating with flushing of the countenance, cold extremities, occasional palpitation, some slight breathlessness on exertion, but no cough; various dyspeptic symptoms, the skin easily excited, a disinclination to exertion, and a general feeling of languor." P. 130.

Where more serious pulmonary disease exists, little permanent good can be anticipated from this climate, except possibly in the instance of persons coming from a latitude further north.

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### THE SOUTH OF DEVON.

THE general characteristic of the climate of Devon is that of being warm and moist. This is in a measure due to its geographical position as regards the ocean, forming as it

does, a portion of a large promontory or imperfect peninsula, projecting westwards into the Atlantic, so that nearly one half of its circumference is sea coast. The mean annual temperature, according to Dr. Shapter,\* is  $51^{\circ} 29'$ , which is nearly one degree higher than that of London. Equability of temperature is said to be one of the distinguishing features of this district. The difference between the warmest and coldest of ten years amounting but to four degrees, and the mean difference of temperature in succeeding years but to one degree and a half. Still, however, it occasionally happens that there are great variations of temperature, and this fact ought ever to be kept in mind by the physician.

January is the coldest month, its average temperature being thirty-nine degrees. The temperature progressively increases till July

\* The climate of the South of Devon, by Thomas Shapter, M.D., London, 1842.



when it attains a mean height of 63° 46'. The change is very gradual during the months of January, February, March, and April, while between April and May it is very considerable. The variation between winter and spring, is less than that between spring and summer, amounting to rather less than eight degrees.

On the whole, it may be stated that the climate here is generally more equable, and the winters are milder, than in most places of a like mean temperature.

The mean height of the barometer is 29·87 inches.

In this district during the winter months the sky is very frequently overcast with clouds, great dampness prevails, and a good deal of rain falls.

The dampest month is November, but the whole period from September till March is characterized by a humid atmosphere.

The mean annual fall of rain amounts,

says Dr. Shapter, very nearly to thirty-two inches (31·90) being about seven inches more than fall in London.

The most rainy seasons are autumn and winter, and months are September, October, November, and December. From March to August the fall of rain is comparatively small. The autumnal rains are heavy, while those of winter partake rather of the character of continual drizzle. But while, as above stated, the quantity of rain which falls annually here is greater than in the metropolis, the number of wet days is not so many, by a wet day being understood a day on which a fall of rain, however slight, takes place. "Here the average annual number of wet days amounts to rather more than a hundred and sixty-two (162·4), while in London it amounts to one hundred and seventy-eight." P. 25.

Frost during the winter and spring is not unfrequent, but the atmosphere seldom

maintains for any length of time a temperature below the freezing point. Snow rarely falls in any quantity, or remains upon the ground beyond two or three days in the low lands.

The prevailing winds of this district are the west and north-west, especially during the months of June, November, February, December, and March. These winds, though blowing, says Dr. Shapter, from the cold latitudes, from passing chiefly over the ocean, are not only modified in temperature, but rendered more equable than any of the other winds. During the winter season, the south-west wind is often accompanied by a warm thick mist, which is peculiarly relaxing.

As a general rule, the winds rarely blow hard in this locality, the tendency is more to gentle and light breezes. Every now and then, however, storms occur, and sometimes of a violent description.

As a proof of the mildness of the climate, we are told that many of the tender and delicate exotic plants flourish in the open air, and are not destroyed by exposure during winter.

The south of Devon, from its contiguity to the sea, its amphitheatre of hills forming an efficient screen against the north and east winds, and its warm and soft atmosphere, has been reckoned a suitable place of resort for persons labouring under pulmonary irritation. It is alleged that many cases of incipient phthisis have been benefited by a sojourn here, in individuals coming from less temperate climes. It is principally, however, in bronchitic affections, where there is extreme susceptibility of the bronchial membrane, that a residence in this district proves serviceable; as also, in many cases of asthma, and in those little, short, irritating coughs, which are de-

pendent upon sub-acute inflammation of the larynx.

The place most frequented by invalids in the south of Devon is Torquay. It is situate on a cove, about two miles from the extreme point of the promontory called *Hope's Nose*, which forms the northern boundary of Torbay. The cove is surrounded by three hills between which run two winding valleys. On the shores of the cove, along the slopes of the hills, and in the gorges of the valleys, the town is built, facing the south-west, and screened from the north and east. The climate is generally understood to be among the warmest and most genial in England.

The surrounding scenery furnishes a variety of romantic and picturesque views, and in this respect a more agreeable place of residence can scarcely be found on the coast.



It appears that its mean annual temperature is rather more than fifty-one degrees and a half, and the mean winter temperature above forty-four degrees. The mean difference between the temperature of successive days in the cold seasons is set down at  $2^{\circ}7$ . "The general mildness of this place," observes Dr. Shapter, "may be somewhat appreciated by the statement of the lowest degree of cold experienced in the generally severe winter of 1837-8, being only  $21^{\circ}$ , while in Exeter it was  $17^{\circ}$ , Bristol  $8^{\circ}$ , Kensington— $0^{\circ}$ , and at Sandhurst 8 below zero." P. 141.

The air of Torquay is said to be drier, and there are less fog and rain than in other parts of Devonshire. The chief objection to the town, however, is the unpleasant smell emitted from the sludge in the harbour at ebb-tide.

Teignmouth and Sidmouth are also places of invalid resort. The latter, from

its southerly aspect, and being sheltered from the east winds, has a very mild climate. During the spring months it is considered a very eligible spot for persons with pulmonary ailments.

Budleigh Salterton, a small unobtrusive watering place, deserves some notice. It is situate in a valley facing the sea towards the south-east, and is tolerably well sheltered from the northern winds. The climate is warm and genial, and less rainy than most other localities on the coast. It is reckoned to be particularly healthy, and well suited for invalids. It affords, moreover, good accommodation for those desiring a place of quiet sojourn.

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## PENZANCE

Is a seaport in the county of Cornwall

agreeably situate on the north-west side of Mount's Bay. From the softness of the climate, it is frequented as a bathing-place, and has been recommended as a residence for invalids affected with chest disease. The late Dr. Young was of opinion that no other situation north of Lisbon had any advantage over London in the mildness of its winter. Penzance, indeed, may be fairly considered as having a temperature  $4\frac{1}{2}^{\circ}$  higher than London in the coldest months. "Placed," says Sir John Forbes, (Observations on the Climate of Penzance) "in the lowest latitude of the island, its seasons ought, on this account, to possess a more genial character, than those of the more northern parts. And this effect of geographical position is greatly increased by other circumstances. The whole of Cornwall, indeed, but more especially the district of the Land's End, possesses, as far as regards climate, all the advantages and disadvan-



tages of a small island. And, accordingly, any one acquainted with the general principles that regulate climate, will have no difficulty in estimating beforehand, the nature of that possessed by this district, if he only considers it as a small island, moderately elevated above the level of the sea, and placed at a considerable distance (say 30 or 40 miles, that is, half the length of the county) to the westward of the most southerly point of the main land." §

The mean temperature of Penzance is estimated at  $52\frac{1}{2}^{\circ}$ , the mean barometric height 29.61 inches. Like all small islands, it has a mean summer temperature considerably under, and a mean winter temperature considerably above, the mean of places similarly situate as to latitude, but differing in the latter, being placed at a distance from the sea, whether on a continent or a large island. Accordingly, the mean temperature of the different months

and seasons is put down as follows, by the author last named :—

| Jan.       | Feb.       | Mar.       | April.     | May.       | June.      | July.      | Aug.       | Sept.      | Oct.       | Nov.       | Dec.       |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| deg.<br>41 | deg.<br>44 | deg.<br>44 | deg.<br>49 | deg.<br>56 | deg.<br>60 | deg.<br>62 | deg.<br>61 | deg.<br>58 | deg.<br>53 | deg.<br>40 | deg.<br>43 |

| Spring.    | Summer.    | Autumn.    | Winter.    |
|------------|------------|------------|------------|
| Deg.<br>45 | Deg.<br>59 | Deg.<br>57 | Deg.<br>43 |

Penzance, from its truly peninsular situation enjoys a remarkable equability of temperature. In this respect it exceeds any other place in the island of which meteorological accounts have been published. In proof of this we have only to mention that the mean thermometric variation of successive months is only  $3\frac{1}{2}^{\circ}$ . The coldest month is January, the warmest month is July. April and October approach nearest to the mean temperature of the year.

Penzance, then, is remarkable for its



small annual, monthly, and daily range, for its uniformity from day to day, and for its mean winter temperature being uncommonly high for a British locality. The difference of temperature, moreover, between the different seasons is very small, especially between autumn and winter, and between winter and spring. Accordingly, while the winters are comparatively warmer, the springs and summers are cooler than in most other parts of the island.

The following quaint but accurate account of the climate of the west of Cornwall, is given by Carew, in his Survey, published about the beginning of the last century. "The *Spring* visiteth not these quarters so timely as the eastern parts. *Summer* imparteth a very temperate heat, recompensing his slow fostering of the fruits with their kindly ripening. *Autumn* bringeth somewhat late harvest, especially to the middle of the shire, where they seldom run their corn

before Michaelmas. *Winter*, by reason of the south's near neighbourhood and sea's warm breath, favoureth it with a milder cold than elsewhere, so, as upon both coasts, the frost and snow come very seldom, and make a speedy departure."

The principal objection to Penzance, however, is on the score of its dampness. This depends not so much on the actual quantity, as on the number of days on which rain falls. The great prevalence of westerly winds may account for this circumstance. These serve to keep the air charged with moisture, and very often bring with them a sort of drizzly rain, sufficient thoroughly to wet the clothes of a person exposed to its influence. It appears, moreover, that the five months from October to February, inclusive, which is the invalid's season, are the wettest, as well in the number of rainy days as in the actual fall of rain.

There is considerable variableness in re-

spect of winds; the most prevalent are the westerly, and next to them the direct south. During winter, when these south and south-west winds are very gentle, the sky is often clear for many days together. "On these occasions," observes Sir John Forbes (*Op. cit.* p. 42), "the warmth and softness of the air are truly delightful; and when taken in conjunction with the beautiful scenery around Penzance, —the calm blue bay,—the gay green meadows,—the myrtles and other exotic plants common in our shrubberies,—one is almost tempted to forget that it is a British, and a winter landscape that he is contemplating."

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### FLUSHING.

THE small village of Flushing near Falmouth, is considered one of the mildest

spots in the west of England, and very desirable as a residence for certain forms of lung disease.

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### HASTINGS.

“HASTINGS is situate in a valley that forms a beautiful amphitheatre sloping to the sea on the south. It is bounded on the north and east by some of the most elevated land in the county of Sussex, probably the most elevated on the southern coast of England; the hill of Fairlight which is about a mile and a half distant, being 541 feet in height. On the west it is screened by a continuous line of hills rising to an elevation of from 200 to 300 feet; and on the south the British Channel presents a wide and exten-



sive bay, stretching from Dungeness on the east, to Beachy Head on the west.”\*

It has been long and justly celebrated as a winter residence for invalids suffering from, or predisposed to, disease of the chest; being, in point of fact, perhaps, the most sheltered nook on the sea side with a southern aspect.

The coast abounds in undulating elevations. The rocks in the vicinity consist of fine pulverulent sandstone, and are surrounded by a belt of weald clay of several miles in breadth. This forms what Dr. Fitton appropriately terms “The Hastings sand and clay formation (iron sand formation).” The soil is composed of immense beds of sand, and sand-rock with calciferous grit, fuller’s earth, slaty clay, and shale, with iron ore. It must, owing to its nature, as

\* On the Curative Influence of the Southern Coast of England, especially that of Hastings, by W. Harwood M.D., London, 1828, p. 16.



Dr. Mackness\* observes, from whose work the above quotation is taken, influence the surrounding atmosphere. The surface, from its light colour, will tend to radiate heat freely, while the porous loamy earth will absorb the superabundant moisture, and by permitting but little evaporation, prevent those dense and cold land-fogs, common to all districts having a clayey sub-soil. Under such conditions, all risk of malaria is obviated, provided there be no luxuriance of vegetation, and this is literally the case at Hastings. It enjoys, indeed, complete immunity from all the ills which arise from the above source.

The town, from its natural bulwarks, is screened against the baneful influence of the north, north-east, and east winds, and visited alone by the more genial winds which blow from the south, west, and south-west. These

\* Hastings considered as a Resort for Invalids, by J. Mackness, M.D., London. 1842.

prevail during the winter season, often many days or weeks together, and determine a very sensible increase of temperature.

The old part of the town, which is immediately sheltered by the cliff, has in general a temperature a degree and a half higher in winter than that of the other part of Hastings and St. Leonards which are more exposed. This is partly due to the air in the lower parts of the valley in which the old portion of the town is built, remaining quiescent, and but little influenced by the winds usually prevalent at this season of the year, and partly to the artificial heat generated in every closely populated locality.

According to Dr. Mackness,\* who instituted a series of meteorological observations during four and a half years, the mean annual temperature is  $51^{\circ}$ ; the mean temperature of winter  $40^{\circ}66$ ; spring  $46^{\circ}10$ .

\* Op. cit. p. 17.

*Mean temperature of Months :*

|                 |                 |
|-----------------|-----------------|
| January . 36°74 | July . . 60°24  |
| February 38°27  | August . 61°51  |
| March . 40°44   | September 61°06 |
| April . . 44°55 | October . 53°48 |
| May . . 52°77   | November 44°85  |
| June . . 58°77  | December 40°95  |

The difference of the mean temperature of winter and summer is 18°25; of the warmest and coldest months 24°77; of successive months, 4°38: of successive seasons, winter and spring, 3°64; spring and summer, 14°61: summer and autumn, 5°69; autumn and winter, 12°56; of successive months, January and February, 1°53; February and March, 2°17; March and April, 4°11.

Dr. Harwood assigns as the mean temperature of the coldest month (February),

43°5. Now Baron Humboldt makes the mean of the coldest month in Edinburgh 38°3; Paris, 35°1; and Rome, 42°1; if therefore, either of the former be considered as a fair average, the mean winter temperature of the southern coast would prove higher than even that of Rome.

The mean yearly height of the barometrical column is, 29·807 inches; the highest range for the year, 30·46; the lowest 28·9.

The amount of rain which falls in winter is put down at 7·44, and in spring at 3·86; London being reckoned 5·85 in the former, and 4·80 in the latter season. The number of rainy days is 158, which is 20 days less than the most favourable average of the metropolis. It further appears that there are fewer rainy days in this district during winter than at the Undercliff, in the proportion of 37 to 43.

Hastings, as regards situation, combines



great beauty of inland scenery, with an extensive and highly varied line of coast.

It offers excellent accommodation for invalids, with ample facilities for taking exercise in the open air during those months which are the most cold and severe. This arises from the peculiar situation of the Parade, which is admirably screened from the bleak winds, and also from the surface of the ground becoming immediately dry after the cessation of rain. The road on the west side of the town is well sheltered by the cliffs, which, during a bright winter's day reflect every ray of the sun.

Hastings, in a sanitary point of view, is almost exempt from those maladies which are generally traced to miasmatic origin: and diseases of the respiratory organs are here far less frequent than in most other places in Britain, or even the south of Europe.



The old part of the town, being, as above mentioned, very sheltered, is well suited to the most delicate pulmonary invalids, during the winter and spring; while those who can take exercise in the open air, may fix their abode in the more modern part, or in the southern range of buildings at St. Leonard's.

The air in the elevated situations of Hastings and St. Leonard's, is of a bracing quality, and admirably fitted to impart that invigorating influence which the human constitution usually experiences from a residence at the sea side.

The proximity to London is a circumstance materially in favour of this place, the journey being accomplished with ease in two hours.

## MADEIRA.

THIS island, one of the African group, is situate in 32 degrees 38 minutes north latitude, and in 16 degrees 56 minutes west longitude; about 80 leagues N. by E. from Teneriffe; 120 leagues from Cape Cantin, on the coast of Africa, nearly 100 leagues from the Isle of Terno, and about 17 leagues S. W. from Porto Santo. According to a geometrical survey made within a few years, it appears to be of the form of a parallelogram. It is about 120 miles in circumference; its greatest length from E. to W. being 45 miles; its greatest breadth from S. to N., 15 miles, and its least length from S. to N. 15 miles, and its least breadth  $8\frac{1}{2}$  miles.

"It is formed," says Dr. Gourlay, in his observations on the Natural History, Climate, and Diseases of Madeira, "of lofty mountains, of hills, and fruitful valleys."

“ Its capital is Funchal, which is situate on the south side of the island, at the bottom of a spacious valley, open to the sea, and surrounded by lofty mountains, having all the appearance of an amphitheatre gradually ascending to a great height. Its mountains and hills generally rise with a slow ascent, the highest point of land being 8,250 feet, or one mile and a half above the level of the sea. The situation of Madeira, in some places, presents a most picturesque and enchanting appearance, while in others, huge perpendicular rock—lofty precipices—prominent ridges—deep excavations and chasms—innumerable cascades, liberally supplied with rivulets—beautiful valleys—deep gullies and ravines, containing immense torrents of water, afford a highly varied, sublime, and no less alarming picture of nature.

The rocks of this island in general, consist of a blue stone, called by the natives,

*pedra viva*; in some parts limestone is found. There are also mineral products of volcanic origin.

The soil, for the most part, is composed of a loose pumice-stone, mixed with a portion of sand and marble; and also a dark-red earth, formed of the two latter ingredients.

Several of the smaller hills consist of a dark-red clay, with a great proportion of black or grey sand. Here and there, a black mould of a shingly nature is met with; in others, a stiff clay; and in some of the higher lands, a kind of marble, intermixed with layers of stone, which is very pulverizable and soon decomposed. The soil is, in general, very productive.

Funchal, the only city in the island, is situate on the south side, in the centre of a spacious valley open to the Atlantic ocean, and defended on the N.N.W. and N.E. by lofty mountains, which towards the north



are a mile in perpendicular height above the level of the sea.

Its edifices, white externally, form a pleasing contrast with the evergreens and plantations, which, at all points, meet the eye. It is said to contain 15,000 inhabitants; it was formerly a mean dirty place, but considerable improvements have of late been made. Most of the streets are on a declivity, and have currents of water running through them, which exercise a salutary action in cleansing away the filth. The airy part of the town affords the most desirable residence during winter.

The salubrity of the climate of Madeira, so highly extolled, is mainly to be attributed to the equability of its temperature. A regular succession of land and sea-breezes cool and purify its atmosphere during the whole year, and especially during the hottest months. Hence, a dew-drop seldom falls, except in the higher parts of the



island; and deleterious effluvia, arising from any source, are dissipated as soon as produced. There is sometimes no rain for months—the atmosphere remaining serene and undisturbed by winds. “I should think,” says the author of “Six Months in the West Indies,” “the situation of Madeira the most enviable on the whole earth. It ensures almost every European comfort, together with almost every tropical luxury. Any degree of temperature may be enjoyed between Funchal and the Ice-house. The seasons are the youth, maturity, and old age of a never-ending, still-beginning spring. Here I found what I used to suppose peculiar to the garden of Eden, and the bowers of Acrasie and Armida :—

‘ Blossoms and fruits, at once with golden hue  
Appeared with gay enamell’d colours mixed.’

“The myrtle, the geranium, the rose, and the violet, grow on the right-hand and on the left in the boon prodigality of primi-

tive nature. The geranium, in particular, is so common, that the honey of the bees becomes something like a jelly of that flower."

However, it ought not to be concealed, that Madeira, notwithstanding its many advantages, has also its drawbacks. Thus, during the summer months, especially during July and August, the heat becomes excessive in low situations, and very enervating to the invalid. The sirocco also visits the island for a day or two at a time, twice or thrice in the year. The effects of this wind, on both the animal and vegetable creation, are peculiar. "In man," says Dr. Pitta, in his "Account of the Island of Madeira," "it occasions diminished perspiration, succeeded by languor and general restlessness; in immediate exposure to its influence, the body is felt as if parched, and the air blows on the surface with a warmth like the blast from a furnace. In the same manner, ve-

getables become dry and parched, and an interruption is put to their further growth. But at this time, the lower situations of the island are found to be the coolest and most bearable."

During the winter months the wind is generally in the direction N.N.E., but seldom prevails to any extent. Snow occasionally falls in the mountainous district, but is never known to lie above a day in the parts lower down. At Funchal, when the tops of the hills are covered with snow, the temperature is about 64° Fahrenheit.

During the summer months, according to the author above named, the thermometer ranges in the course of the day from 68° to 76°; its medium heat in the shade being from 72° to 74°. In the course of the summer it sometimes rises to 80° and upwards, and during the prevalence of hot winds it stands even so high as 84°. During

the sirocco wind it has at times risen much higher.

In winter it ranges from  $57^{\circ}$  to  $65^{\circ}$ ; its medium pitch in the shade being from  $60^{\circ}$  to  $64^{\circ}$ . In the course of this season it falls below  $57^{\circ}$  only when the northerly winds with falls of snow prevail on the heights. It seldom rises above  $65^{\circ}$ , except when there are easterly winds.

The winters in Madeira may be compared to the summers in England in everything but the length of days, and those sudden changes from heat to cold to which England is subject.

The following is the mean height of the thermometer for every month, taken from an average of four years' observations, as given in a work on the "Temperature of different Latitudes," by Richard Kirwan, F.R.S.



|          |           |           |           |
|----------|-----------|-----------|-----------|
| January  | 64°18     | July      | . . 73°45 |
| February | 64°3      | August    | . 75°02   |
| March    | . 65°5    | September | 75°76     |
| April    | . 65°5    | October   | . 72°5    |
| May      | . . 66°53 | November  | 69°08     |
| June     | . . 69°74 | December  | 65        |

Subjoined is the average temperature of Madeira compared with that of London, for the whole year, as well as during the coldest and warmest months, which are January and July.

Taking the average temperature of London at 1000, the heat of Madeira is 1319. In January, 0559—July, 1128.

During the day the whole range of the thermometer seldom at any season exceeds 2 or at most 4 degrees, and frequently, for several days together, the same degree of heat is indicated.

The mean height of the barometer is 30 inches, its greatest 33 inches, and its lowest 29 inches.



Madeira, on account of its genial temperature, is well suited to invalids suffering under pulmonary disease, from November till June. In the intermediate period, however, the heat is almost insupportable. Hence, many persons in order to escape the depressing influence of the sultriness of the climate, during the hot months, take a voyage to Teneriffe. This, the most important of the Canary Islands, is reckoned peculiarly healthy. The sea voyage, moreover, has in most instances a beneficial effect on phthisical subjects.

Though this island enjoys, as above stated, a mild atmosphere and immunity from those vicissitudes of weather which affect the more northern regions, it is equally the seat of disease as other countries. Among these phthisis is not uncommon. Persons of all ages and of both sexes, fall victims to it; nay, according to Dr. Gourlay, whole families have at times been suddenly

swept away by it. Catarrh and pneumonia are also met with, and fevers of different kinds.

Nevertheless its climate exercises a powerful sanative influence. Hence, Madeira may be resorted to with great advantage in all cases of bronchitic affection, especially when conjoined with a disposition to phthisis; in the incipient stage of phthisis, where the patient is in delicate health, teased with a hacking cough, and the glandular system out of order, provided no fever be present: in a subsequent stage of the same malady, where there are cavities, but well lined, and also absence of febrile movement; in cases again where the lung is compressed, provided the cutaneous function be in full activity. In all the above instances, life may certainly be prolonged by spending the winter months in this "sunny isle."

We may observe that the voyage thither is now made in five or six days; ample ac-

commodation in board and lodging is to be had at the rate of £10 a month ; and good medical advice may be procured at all times.

Delicate invalids, incapacitated from walking, are enabled to take rural excursions by means of sledges drawn by oxen. Those who can ride may procure ponies, which are sure footed and rough-shod to prevent them stumbling.

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### NICE.

NICE is the chief town of the country of Nice, or Nizza. It is beautifully situate on the Gulf of Genoa, in a plain which is about five miles in length by three in breadth ; and is bounded on the west by the river Var,

which divides it from Provence, in the south of France; on the south by the Mediterranean sea, which comes up to the walls; and on the north by the Maritime Alps, which begin from the back of this plain with hills of gentle ascent, rising by degrees into lofty mountains and forming a sweep or amphitheatre ending at Montalbano, which projects into the sea and overhangs the town to the east. The river Paglion, which descends from the mountains, and is supplied only by the rains or the melting of the snows, washes the walls of the city and falls into the sea on the west.

The channel of this river is very wide, but never full of water, except after heavy rains or the melting of the snows in the Alpine regions, when it becomes a formidable torrent.

The surrounding country is most delightful and pleasant, and was resorted to by the Romans for the restoration of their health.

The inhabitants enjoy, as it were, a perpetual spring. The heat imparted by the sun during the winter months is nearly equal to that of the month of May in England. Olives, vines, pomegranates, almonds, oranges, citrons, lemons, flourish in all the luxuriance of tropical vegetation.

The city is much frequented by persons in delicate health, and many of our own country people are always found here enjoying the balmy air. It once had a reputation for the cure of consumption, but this, subsequent experience has taught us was not founded on fact.

The air is serene and remarkably free from moisture, but frequently impregnated with saline particles which prove irritant to the skin. Whatever clouds may be formed by evaporation from the surrounding sea, they seldom hover long over this district, but are attracted by the mountains, and then fall as rain and snow.



The town possesses a great variety of climate. The warmest part is that called the Ponchette where the London Hotel is situate; this quarter, according to Dr. Farr,\* has been found to be  $4\frac{1}{2}$  degrees warmer than most others; the coldest part is near the River Paon, a mountain torrent, which brings with it a current of cold air from the fissures in the mountains, which sets in every night at sunset, and lowers the temperature of all situations on and near its banks several degrees below the other parts of the town. This wind always comes from the north, and is harassing to invalids.

The warmest part of the environs of Nice is under the Cimiez hills. It is several degrees hotter than the hottest part of the town, and is exceedingly well-sheltered from all pernicious winds; even the baneful *mistral* is not felt here in the plain. During the

\* Medical Guide to Nice, London, 1841.

prevalence of the wind, observes Dr. Farr, there is a counter-current near the surface of the earth, frequently from the south and south-east, whilst at an elevation perhaps of 200 feet the *mistral* is blowing in full force from the north-west; the easterly and north-east winds also are seldom felt severely in this plain; for these reasons, the temperature is much higher here than elsewhere. Besides, the atmosphere in this valley is not contaminated with saline particles, because they are never wafted so far inland. The most humid part of the suburbs is on the road to Villa Franca.

It appears from the result of ten years' meteorological observations, that the thermometer fell below the freezing point only three times, and that not every year, but in two years out of three: on these occasions the fall never exceeded 27° Fahrenheit, while it has often risen during winter to 68°. In spring the minimum of temperature is 43°—

the maximum  $84^{\circ}$ . The extremes of temperature are generally as follow : in winter from  $41^{\circ}$  to  $57^{\circ}$  ; in spring from  $55^{\circ}$  to  $70^{\circ}$  ; in summer from  $67^{\circ}$  to  $80^{\circ}$ , and in autumn from  $56^{\circ}$  to  $66^{\circ}$ . The mean temperature of the year is  $61^{\circ}$  ; of winter  $47^{\circ}$  ; of spring  $63^{\circ}$  ; of summer  $72^{\circ}$  ; of autumn  $54^{\circ}30$ . The mean difference of temperature of each succeeding month is  $4^{\circ}30$ .

The greatest height of the barometer is assigned at  $28\cdot6$  inches, the lowest at  $27$ , the mean is  $27\cdot6$  inches.

The prevailing winds are very variable owing to the situation of the territory, bounded as it is by mountains, capes, and straits. By such sharp and often sudden vicissitudes, the human constitution is severely tried. For it may happen, that while the heat from the sun is so overpowering that a person cannot take exercise out of doors without discomfort, the wind is frequently so keen and piercing as to prove

most injurious to invalids, especially those of the pulmonary class. This is particularly the case in March, when the east winds set in. Were it not indeed for these winds, Nice would possess perhaps the finest climate in the world. The winds most prevalent during the course of the year are the S.S.E., the S.E., the S., the E., and the N.E. The *mistral*, or N.W. wind, is by no means so severely felt here as in Provence.

The average yearly fall of rain is set down at 24 inches by the rain-guage. But the intervals at which rain falls are often far apart. Hence the air gets very parched. It is indeed the dryness and the exciting and irritating nature of the atmosphere, which constitute the main drawbacks to Nice. "In the winter months," remarks Dr. Pugh,\* "you never meet an inhabitant

\* Observations, p. 24.



of Nice without his cloak wrapped about him, and his mouth and nose stopped with his handkerchief or muff, that the air might not enter into his lungs without passing through a medium to soften it."

The invalid season is from the beginning of October to the end of February, after which the patient had better proceed to Malta or Malaga.

No delicate person ought to be out of doors at or after sunset, on account of the rapid fall of temperature, arising principally from the setting-in of the land wind.

The most advantageous spot for pulmonary invalids, in Dr. Farr's opinion, is the valley of the Cimiex Hills. This is tolerably protected from every adverse wind, adorned with a more luxuriant vegetation than any other part of the vicinity, and well watered by numerous running streams. Here, the valetudinarian will always find a sheltered walk, a warm and genial atmosphere, whilst



in most other localities around Nice the air is cold and piercing.

It may be inferred from the foregoing statement, that the climate of Nice is admissible only in the early dawn or invasive stage of phthisis; where the disease has made progress it is too dry, irritant, and exciting, and consequently prejudicial.

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### NAPLES.

NAPLES, the ancient Parthenope, is built in the form of an amphitheatre. It is surrounded by mountains and the sea, and nothing can exceed the beauty of its bay. Blessed with the mildest climate of Europe, it is nevertheless subject to extreme vicissitudes in the temperature of the atmosphere.

"If a stranger," says Dr. James John-

son,\* "were to arrive at Naples by sea, and that for the first time in the month of November or December, he would be left to form a very erroneous idea of the climate, according to the point from which the wind blew. If it came from the south, he would be inclined to think that there was little difference between Naples and the black-hole of Calcutta. If from the north-east, he would begin to doubt whether he had not sailed in a wrong direction, and made the Gulf of Finland instead of the Gulf of Salerno. If a gentle north-west zephyr skimmed the surface of the deep and wooded shores of Baiæ, he might be tempted to think that he had got into the gardens of the Hesperides or the Isles of Atlantis, so green is vegetation, so balmy the air, so mellow the sun-beams, and so azure the skies."

Despite its great natural attractions,

\* Change of Air, p. 201.

Naples is a very questionable place of sojourn for pulmonary invalids. The sudden transitions from the excess of heat to that of cold in the course of the same day are most trying. In winter the weather is at times very severe. Dr. Pugh\* informs us, that three nights of sharp frost in the month of January killed all the orange, lemon, pomegranate, and other tender trees in the environs, and caused more damage than could be repaired by a long succession of the mildest winters.

The sirocco, "Auster's sultry blast," is not an unfrequent visitant, and produces the most terrible nervous depression and muscular languor. This may be followed by the tramontane, an intensely cold north-east wind which comes down from the Apennines, and carries an icy chillness to the very inmost recesses of the frame, highly

\* Observations, p. 6.

prejudicial to the invalid previously enervated by the relaxing heat of the sirocco.

The following extracts from Mr. Mathews' "Diary" are conclusive as to the treacherous character of the Neapolitan climate. Mr. Matthews being himself in delicate health, could write feelingly on the subject.

"*February 11th.* The weather is beautiful, and as warm as a June day in England. We sit at breakfast without a fire, on a marble floor, with the casements open, enjoying the mild breeze.

"*February 12th.* Oh this land of zephyrs! Yesterday was as warm as July,—to-day we are shivering with a bleak easterly wind and an *English black frost*. Naples is one of the worst climates in Europe for complaints of the chest. Whatever we may think of sea-air in England the effect is very different here. The sea-breeze in Devonshire is mild and soft—here it is keen and piercing.

"*March 14th.* *Aegri Somnia*;—if a man be



tired of the slow, lingering progress of consumption, let him repair to Naples ; and the *dénouement* will be much more rapid. The *sirocco* wind, which has been blowing for six days, continues with the same violence."

In the same month and in the same page we find the following startling announcement.

"Seized with an acute pain in my side. Decided pleurisy; summoned an English surgeon: high fever; copious bleeding; owe my life under heaven to the lancet. I find pleurisy is the *endemic* of Naples."

Dr. Pugh, in the work already cited, mentions the case of a young nobleman, whose lungs were diseased, and who came to Naples with a design to spend some of the winter months, but the air had such an effect on him that he could scarce breathe, and he was compelled to hurry away in the course of eight or nine days to a more suitable climate.



In concluding this brief notice, we may observe that the sea in the bay of Naples has no tides, or next to none. Hence its surface is generally as smooth as that of a fishpond, and the mountains and highlands which surround the bay prevent a free circulation of air, so that the atmosphere is constantly loaded with vaporous exhalations.

In Naples a twenty-eighth part of the population dies annually,\* while in London it is only one-fortieth. Therefore in England the expectation of human life is nearly double what it is in Naples. From this we may gather how the popular Italian adage,

\* "By the returns for the year 1830, the annual ratio of mortality at Naples, without wars, famine, or epidemics, was increased to 1 in 23 of the population—thus proving the climate more deleterious than that of Rome itself."—*Change of Air*, by Dr. James Johnson, p. 260.

"See Naples and die," may be interpreted in more senses than one.

Although there are occasionally heavy falls of rain here, yet the numerical amount of rainy days is little more than half what it is in London, the annual average being 97.

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### FLORENCE.

THIS renowned city, built on the banks of the river Arno, is remarkable for the beauty of its surrounding scenery. Behind, rise hills covered with olive and fig-trees, and other plants natives of warmer climes; still farther, high mountains clothed with immense forests; and beyond them in the distance are to be seen towering the rugged

summits of the lofty Apennines. The whole valley appears as one continued grove and garden.

The city itself spreads along the side of the river, "a yellow muddy stream." The streets are paved with large flat stones, and are more uniformly wide than those of most other towns of Italy. Although they are considered as particularly clean by the English residents, yet Dr. James Johnson affirms "there is not a street in this celebrated capital of Tuscany, which does not shock the eye and olfactories of an Englishman."

The mean temperature of Florence is about 55°. The climate is generally esteemed healthy and bracing, but with its chilling tramontanes from the north and its siroccos from the south, is by no means favourable to the pulmonary invalid. Indeed, during the winter months the air is at times felt bitterly cold, especially when influenced

by that arctic wind from the Apennines, which it is said "cuts one to the heart."

On the above ground we should recommend patients desirous of spending the winter in Tuscany, to proceed along the valley of the Arno till they reach Pisa. Here they will find a sheltered position, admirably adapted for a residence during the months of December, January, and February; and where they may enjoy the privilege of a comfortable and salubrious walk, almost daily, in the very depth of winter.

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### ROME.

THE ancient capital of the Roman empire, and now the metropolis of the papal



territory, is built chiefly on the eastern bank of the Tiber, which runs here in a southerly direction. The streets are, in general, gloomy, irregular, and dirty, and narrower than those of London. They seem built to exclude as much as possible the rays of the sun, and during winter, are at times as damp and cold as rain or frost can make them. A sensible difference may often be perceived between the temperature of one street and that of another. Hence, delicate individuals incur considerable risk in taking exercise out of doors, unless provided with warm clothing.

To repair hither with the hope of *escaping* the winter, is a grievous mistake. "If the thermometer be not so low," observes Mr. Mathews, "the temperature is more variable, and the winds are more bitter and cutting."

The only advantage would appear to be that the cold season is of comparatively



brief duration, for while it lasts winter is more severely felt here than on the southern coast of England. "And then," emphatically exclaims the author just quoted, "what a difference between the warm carpet, the snug elbowed chair, and the blazing coal-fire of an English winter evening, and the stone staircases, marble floors, and starving casements of an Italian house, where everything is designed to guard against the heat of summer."

The average number of rainy days annually is estimated at 117, which is 61 less than London. The mean temperature of the year is  $60^{\circ} 4$ ; the mean temperature of winter is  $45^{\circ} 8$ ; of spring,  $57^{\circ} 8$ ; of summer  $75^{\circ} 2$ ; of autumn,  $62^{\circ} 8$ ; of the warmest month,  $77^{\circ}$ ; of the coldest month  $42^{\circ} 2$ .

In Rome a 25th part of the population is cut off annually by death. This large mortality may be partly accounted for by

the deleterious influence of malaria, which contaminates the atmosphere of certain districts of the city and suburbs in summer and early autumn, and is productive of much serious disease and suffering. Accordingly, during the above seasons of the year Rome is highly insalubrious, and ought to be shunned, especially by the valetudinarian. By taking common precaution against the climate, however, individuals may sojourn here between September and June without risk of detriment from miasmatic agency.

The following excellent summary of our knowledge on the important subject of medicinal influence of an Italian climate, is given by Dr. James Johnson. It is the more valuable as having been deduced from direct observation.

“I. In delicate health, without any proof of organic changes in the lungs, in what is called a ‘tendency to pulmonary affection,’

a journey to Italy, and a winter's residence there (under strict caution), offer probabilities of an amelioration of health.

“ II. In cases where there is a suspicion or certainty of tubercles in the lungs, not softened down or attended with purulent expectoration, an Italian climate may do some good, and may do much harm—the chances being pretty nearly balanced.

“ III. Where tuberculous matter appears in the expectoration, and where the stethoscope indicates that a considerable portion of the lungs is unfitted for respiration, a southern climate is more likely to accelerate than retard the fatal event—and takes away the few chances that remain of final recovery.”\*

Subjoined is a table of the mean morning temperature of the three coldest months at Nice, Pisa, and Rome, compared with that

\* *Change of Air*, p. 268.

of Penzance, for the same years Clark quoted by Forbes (Op. cit. p. 64).

| Fahrenheit's<br>Thermometer. | Time of Ob-<br>servation. | Dec. | Jan. | Feb. | Mean. | Extreme<br>range. | Absolute. |      |
|------------------------------|---------------------------|------|------|------|-------|-------------------|-----------|------|
|                              |                           |      |      |      |       |                   | Max.      | Min. |
| Nice, 3 yrs., 1815-17        | Sunrise.                  | 44   | 44   | 47   | 45    | 33                | 63        | 30   |
| Pisa, 3 yrs., 1814-16        | Sunrise.                  | 42   | 40   | 43   | 41    | 40                | 60        | 20   |
| Rome, 3 yrs., 1815-17        | 7 A. M.                   | 42   | 41   | 43   | 42    | 37                | 64        | 27   |
| Penz, 3 yrs., 1815-17        | 7 & 8 A. M.               | 42   | 41   | 44   | 42    | 36                | 58        | 22   |

## MONTPELLIER.

IN the department of Herault, formerly Languedoc, is a considerable town, one of the richest and most agreeable of France. It is situate on the slope of a hill and on the stream Merçanson. To the south is the Mediterranean, to the west the Pyrenees, and to the east the Alps. The air is pure, keen, and piercing. Mathews says, in his



Diary of an Invalid, "It is difficult to conceive how Montpellier ever obtained a name for the salubrity of its climate. For pectoral complaints it is probably one of the worst in the world. It is true, there is almost always a clear blue sky: but the air is sharp and biting, and you are constantly assailed by the *bise* or the *marin*; and it is difficult to say which of these two winds is the most annoying.

"The one brings cold and the other damp. The climates of Europe are but little understood in England, nor indeed is it an easy thing to ascertain the truth with respect to climate. Travellers, generally speak from the impression of a single season, and we all know how much seasons vary."—Vol. ii. p. 155.

He remarks in another place, in speaking of the air, that "every mouthful of it irritates weak lungs, and sets them coughing." The mean temperature of the year is  $59^{\circ} 4$ ;



of winter,  $44^{\circ} 0$ ; of spring,  $57^{\circ}$ ; of summer,  $75^{\circ} 8$ ; of autumn,  $61^{\circ} 0$ ; of the warmest month,  $78^{\circ} 2$ ; of the coldest month,  $42^{\circ}$ .

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## PAU.

PAU may be reckoned in many respects the most suitable locality for a pulmonary invalid in the south of France. It is the capital of the ancient province of Bearn, and now the chief city of the department of the *Basses Pyrénées*. The town, which extends from east to west, is built upon a terrace which overlooks the river Gave, at an elevation of 150 feet. It is protected on the north by the *Landes* of the Pont Long, on the west by a well-wooded park. It is

thus sheltered from the north-west and westerly winds. The east and south-east winds are scarcely felt, except in their bringing dry and warm weather. According to Dr. Taylor,\* Pau "almost generally enjoys a stillness of atmosphere so complete, as to leave a doubt as to how the wind really blows."

Mr. Inglis in his work entitled "*Switzerland, the South of France, and the Pyrenees*," thus describes Pau:—"It has always enjoyed the reputation of being one of the most interesting cities of the South of France; and altogether I think it deserves its reputation. It lies in one of the most beautiful and most abundant countries of Europe, in one of the finest climates, and the city itself is clean, airy, and abounds in every convenience, and in most luxuries. As for the environs of Pau, they are cer-

*On the Curative Influence of the Climate of Pau,*  
do., London, 1843.

tainly beautiful. The Gave serpentine through the charming undulating country that surrounds the town. Grain, meadows, and vines, diversify the scenery, and innumerable country-houses are everywhere scattered around. Nothing can exceed the beauty of the promenades in the neighbourhood of Pau. Some lie along the side of the Gave, others along the banks of the smaller river, and within the town there is a large and shady platform which commands a magnificent view over the surrounding country. Pau is a great resort for strangers, and I should think the most desirable of any of the towns which are selected by foreigners as a residence."

The leading feature with regard to the climate of Pau, is the mild and sedative nature of the atmosphere, conjoined with the almost total absence of wind.

According to Dr. Taylor, the mean temperature of Pau for five consecutive years is

56°34; and that of the different months for the same period as follows :—

|              |       |             |       |
|--------------|-------|-------------|-------|
| January . .  | 41°20 | July . .    | 68°60 |
| February . . | 43°60 | August . .  | 73°40 |
| March . .    | 48°80 | September   | 68°50 |
| April . . .  | 51°80 | October . . | 58°50 |
| May . . .    | 61°60 | November    | 47°00 |
| June . .     | 68°20 | December    | 42°80 |

*The mean temperature of the seasons for the above period of five years, is,*

|         |         |         |         |
|---------|---------|---------|---------|
| Winter. | Spring. | Summer. | Autumn. |
| 42°53.  | 54°06.  | 70°06.  | 52°00.  |

The average quantity of rain that falls annually, may be set down approximately at 42 inches. The number of rainy days in the year, taking an average of seven years, amounts to 119. As a general rule rain sel-

dom continues longer than two days at a time, and is usually followed, ere long, by warm sunshine, while the ground, from the absorbent nature of its gravelly soil, dries rapidly. The atmosphere, moreover, is remarkably free from hygrometric pressure.

In January there is occasionally slight frost. Any snow that may then happen to fall is seldom visible after the lapse of a few hours.

The native inhabitants of Pau, are on the whole a healthy race ; and the average mortality is inconsiderable. Here one person in 45 dies annually, whereas in Nice it is one in 31, and in Rome one in 25.

The climate of this district exercises a peculiar calming and soothing influence in all cases of undue vascular and nervous excitability. Hence its utility in bronchial affections, where there is much irritability of the mucous membrane, with extreme sensibility to harsh cold winds. It is said



to have occasionally proved beneficial in the early stages of consumption, seeming to arrest, so to speak, the development of tubercle. It is, however, chiefly, says Dr. Taylor, in diseases of the mucous membrane of an obstinately sub-acute character that it acts favourably ; as, for instance, in those "of the trachea or bronchi, accompanied by dry hacking cough, absence of healthy expectoration, and quickened pulse, with emaciation." Page 3.

On the other hand, in all cases of disease connected with an atonic and relaxed state of the system, such as the catarrh of old people, the climate of Pau is prejudicial.

It may be stated that the Pau season commences on the 1st of September and continues till the 1st of June.

## SPAIN.

THE climate of Spain has of late years attracted considerable attention and interest, more particularly so to the invalid in search of health, as offering advantages, from its southern situation, superior to any along the shores of the Mediterranean. The first deserving of notice is Cadiz in  $36^{\circ}32$  north lat.,  $6^{\circ}18$  west long. Cadiz is the principal commercial city of the Spaniards, standing on the S.W. coast of Spain, in the province of Andalusia, and on the northern extremity of a peninsula ten miles in length by three in breadth, it almost deserves the name of an island, a very narrow neck of land only dividing it from the mainland, between which is the harbour of about the same length, but rather wider. The city is well fortified by craggy rocks, and is considered inaccessible from

the sea-side ; it is well defended by two forts of considerable strength, the one on the mainland, Matagorda, near Fort Real, the other on the peninsula St. Lorenzo. In 1823, Cadiz was the last stronghold of the revolutionists ; the Fort during the late war proved impregnable, but after a tremendous fire kept up by the batteries of the assailants for six days, a breach was made, and the Cortes compelled to lay down their arms and restore Ferdinand to liberty. The streets are narrow, but clean, and the houses lofty, with flat roofs which answer two purposes, for a promenade, and to catch the rain that falls. A great drawback to the comfort of its inhabitants is the want of good water ; the chief supply is from the mainland, from springs near St. Maria. The climate of Cadiz is not subject to any great range of temperature ; when the strong westerly winds prevail, great humidity, a necessary consequence, is experienced ; at

other times the air is dry and balmy. Cadiz, as a winter residence, is well suited for many of those affections of the lungs and air-passages, which compel a large class of invalids to seek relief in a warmer climate than England. Dyspeptic patients will often be benefited by a residence at Cadiz. To those of a relaxed habit of body, and subject to habitual cough, accompanied with profuse secretion, a dryer air would be preferable to that of Cadiz.

Dr. Francis, in his work on "Change of Climate," gives the mean annual temperature of Cadiz at  $62^{\circ}75$  which he states to be two degrees warmer than Rome and Pisa, six than Pau, one than Naples, but colder than Madeira by two, and than Malaga by four degrees

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### MALAGA.

MALAGA is a place of great antiquity situ-

ated on the south-west of the coast of Spain,  $36^{\circ}45$  north lat., and  $4^{\circ} 30$  west long., in the bight of a bay on the coast of the Mediterranean, open to the south, and bounded by ranges of lofty mountains. Malaga, from the earliest ages, has been renowned for its commerce, and at the present day must be considered the most flourishing city in the province of Andalusia. Malaga enjoys a serene and delightful climate; the atmosphere is peculiarly dry and unclouded, and well suited for the pulmonary invalid; indeed, from the testimony of those who have given it a trial, it would seem to offer advantages superior to any on the shores of the Mediterranean.

The following is from the pen of a medical gentleman (the late H. J. Macdougall) who spent the winter of 1849-50 there. "The great characteristics of the climate are the unusual *dryness* and *clearness* of the air, and the favourable nature of the two



most trying months in the year February and March. Of the humid climates resorted to by invalids, the principal are :—Madeira, Palermo, Rome, Pisa, and Pau. The dry climates, Malaga, Malta, Egypt, Naples, and Nice. I have already classed the climate of Malaga with that of Malta. The whole winter may be compared to an English May. In November and even December it is sometimes as warm as the latter end of May occasionally proves in England.

“ The advantages of Malaga as a residence for invalids, are the dryness and brightness of the air ; a brilliant sky and perpetual sunshine cheer the spirits ; rain falls on only a small number of days ; and a thorough wet day is of very rare occurrence.” It would appear that Malaga is the warmest of our bracing climates, not even Malta excepted ; it is decidedly preferable to Madeira, or any of the places usually resorted to by invalids on the coast of Italy. There is no place

without its inconveniences ; those at Malaga would seem to arise from the want of good accommodation and suitable necessities for the invalid. The fine particles of sand that blow over the city are often a source of great annoyance, and from their mechanical irritation produce cough and other distressing symptoms. The mean annual temperature of Malaga, is 66°, that of the winter 55°. The affections of the chest and air-passages likely to derive benefit from a winter sojourn at Malaga, are the tuberculous and others of a cachectic character, which are observed in this country to rapidly degenerate into phthisis. The early development of tuberculous matter may be often checked in its progress and ravages, by transportation to a southern climate, the choice of which will of course depend on the constitution and temperament of the patient ; one may require a dry warm bracing air, another a mild soft atmosphere, well

sheltered from the cold winds that occasionally blow even in the most favourable localities. It is a nice point for the medical practitioner to decide how far he is justified in sending from home to a foreign climate, the pulmonary invalid, when disease has already made considerable advance.

It is a well known fact that patients have been hopelessly condemned by medical gentlemen in this country from the supposed existence of large vomicæ in the lungs, and who afterwards have recovered without any trace of the previous disease remaining. It might therefore be argued that if the diagnosis has been correct that many more might have been rescued, had they received the benefit of a sojourn in a southern climate. Chronic cough from bronchial irritation, disease of the larynx and trachea, spasmodic asthma, and other forms of disease connected with the chest, will be benefited by a residence at Malaga. Children of

delicate health, more particularly those suffering from strumous affections, will gain strength daily in the climate of the South of Spain.

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### WEST INDIA ISLANDS.

THE West India Islands, or British Antilles, with the exception of those of Bahama and of Bermuda, do not afford a favourable place of residence for pulmonary invalids.

In these islands, according to Dr. Pinckard (Notes on the West Indies), the free current of air is interrupted by woods and mountains; and the towns which are closely built, with narrow streets, and a more or less crowded population, are unwisely placed under hills or lofty promontories, where both the direct and reflected rays of the sun are concentrated as in a furnace; or they are erected at the confines of the deepest bays,

whither the refreshing breeze can seldom penetrate. Hence, from the mere effect of situation, the temperature may be higher even than in places nearer the equator.

In the shade of sandy Kingston at Jamaica, the thermometer rises sometimes to  $90^{\circ}$ ; and at Port au Prince, in St. Domingo, about  $19^{\circ}$  north latitude, it is often as high as  $93^{\circ}$ .

The north wind blows from November to February, and sometimes lowers the temperature to  $69^{\circ}$  of Fahrenheit. Its prevalence is marked by epidemic rheumatism, and catarrhal affections. The south wind, which is warm and humid, blows from July to October, and raises the thermometer to  $95^{\circ}$ . Its influence is dangerous and malignant. The east wind prevails in March, April, May, and June, and is not so dry or warm as the preceding. The inhabitants are, however, sometimes exceedingly inconvenienced by a dry land wind from the east,



which is equally parching as the sirocco of Italy, and induces very generally the distressing symptoms of influenza. Pain is experienced in the head, nose, and throat, and the air as it passes into the lungs, feels hot, dry, and irritating. The attack comes on suddenly, and its effects continue three or four days.

The tendency of the climate in the regions near the equator, is to produce a relaxed state of the system, with augmented rapidity of the respiration and the circulation, conditions very unfavourable to persons labouring under tubercular cachexy.

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The Bahamas or *Lucayos Islands*, are situate between 21° and 28° of north latitude and 71° and 81° of west longitude. The climate is in general salubrious. The more northern of the group during the winter

months are rendered cool and agreeable by the north-west breeze from the continent of America. At New Providence the temperature in winter ranges from 60° to 65° in the shade.

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### THE BERMUDAS.

THESE islands, about 400 in number, are situate half-way between Nova Scotia and the Antilles. The largest is about twelve miles long. The navigation in the neighbourhood is dangerous.

The poet Waller spent several months in the Bermudas, and gave a most flattering account of the serenity of the climate, and of the manners of the inhabitants. But subsequent experience has not confirmed the glowing description of the poet. For although

there is but little variety of temperature in the different seasons, and spring may be said never to forsake these islands, the climate is by no means healthy, and only a short residence is necessary to cause the germs of constitutional disease to appear. It is alleged that yellow fever frequently assails the residents, and that typhus fever has recently made its appearance among them. In spite of these drawbacks, however, it is not uncommon for pulmonary invalids to come hither from the United States of America.

THE END.

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